Australian Personal Computer

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COMMEMORATIVE 10th BIRTHDAY SUPPLEMENT

Looking back on the decade of microcomputing

The 10 . . . best products • worst products • best Aussie innovations • most memorable quotes • most significant events • most notable companies

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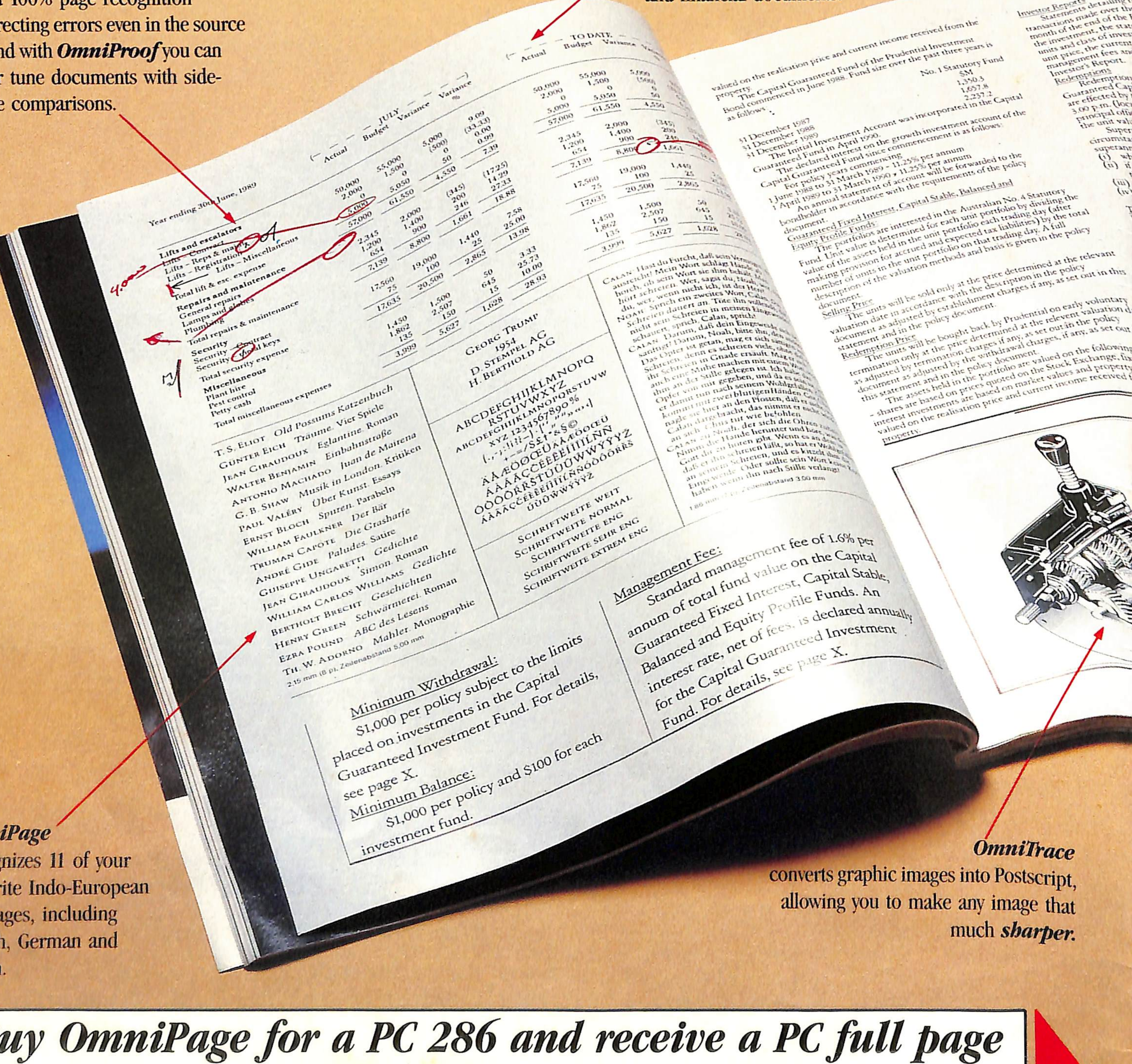

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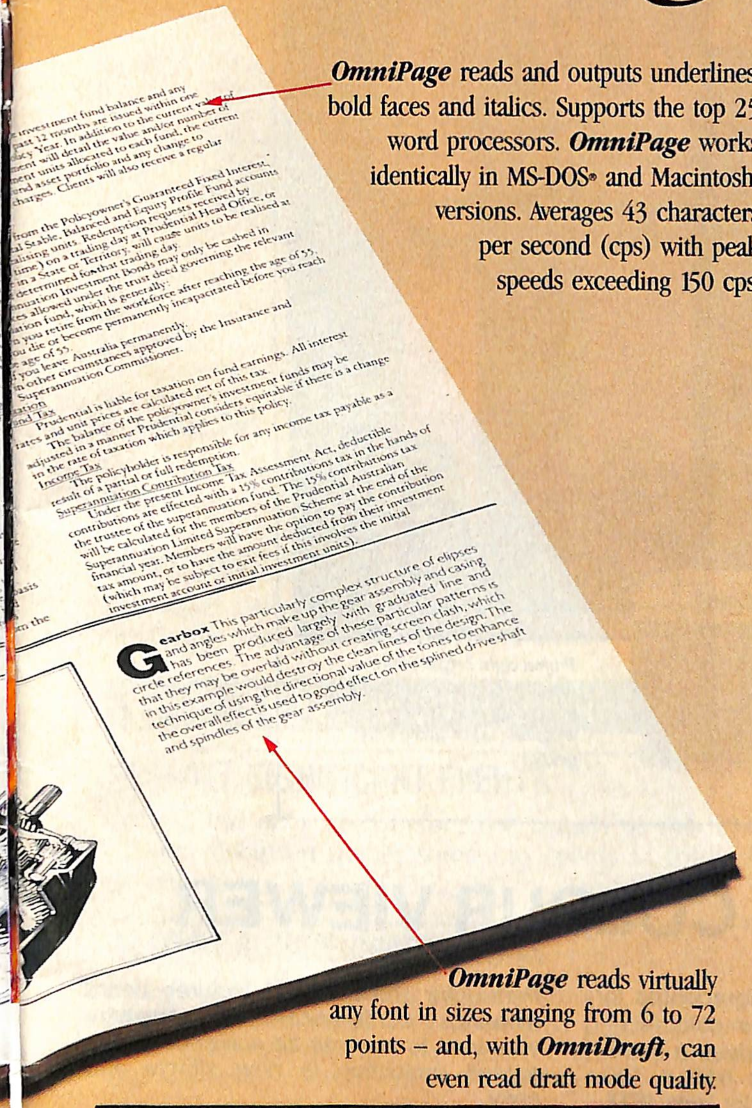

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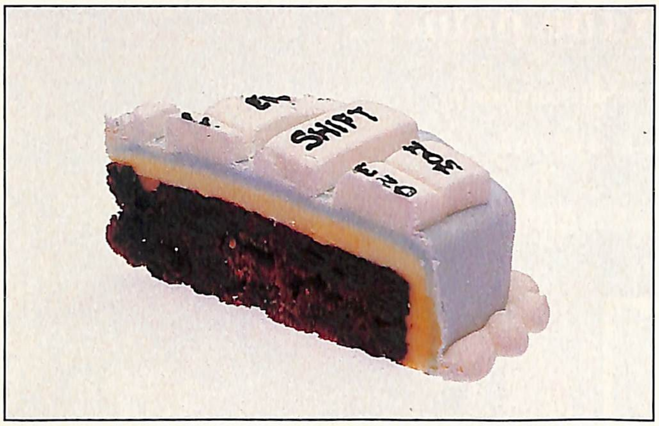
Contents

APC's 10th Birthday Supplement



5 TIMELINE

John Sterlicchi presents a chronicle of the last decade of personal computing.

26 VOLUME ONE, NUMBER ONE

Ian Davies peruses our first issue ever, commenting on the 'retro' products available at the time.

THE TEN . . .

35 MOST SIGNIFICANT EVENTS

Musing the days even before the launch of the IBM PC, Ian Robinson details some big events in the last decade.

39 BEST AUSSIE INNOVATIONS

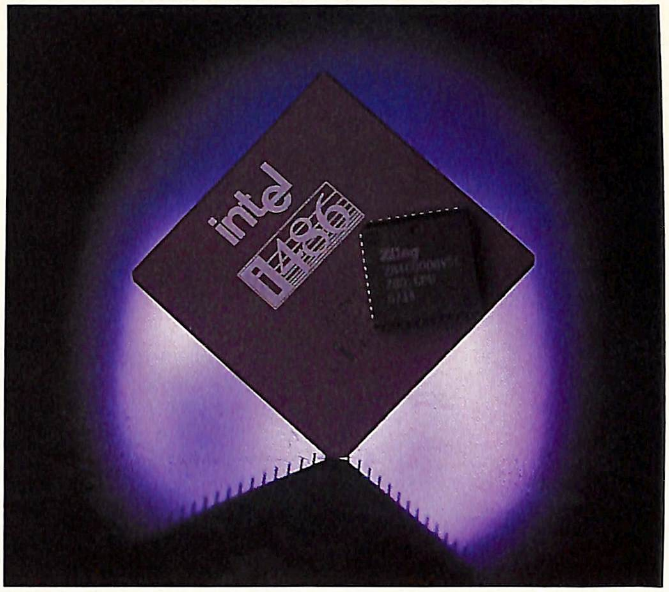
Not all have made it onto the international scene, but many Australian-made and developed products have been landmark innovations. Kester Cranswick checks out Australia's contribution to PC technology.

49 BEST PRODUCTS

What makes a product so good? Phil Cohen examines 10 remarkable (well . . . at least in their day) products.

55 WORST PRODUCTS

Yes, we all make mistakes. Kester Cranswick exposes the 10 worst product releases this decade.



Page 20: Then and now . . . Zilog's Z80 chip and Intel's i486

61 NOTABLE COMPANIES

Jeremy Horey takes a look at how, when and why 10 companies rose to their heights of success.

71 MOST QUOTABLE QUOTES

Ian Robinson searches through the archives and finds 10 classic quotes some people would rather he forgot.

AUSTRALIAN
Personal
Computer
A GUIDE TO BUSINESS SOFTWARE
AUSTRALIA'S FIRST MICRO MAGAZINE
ARTIFICIAL INTELLIGENCE WITHOUT TEARS
David Levy series on game theory

Page 26: *APC's* very first cover back in May 1980

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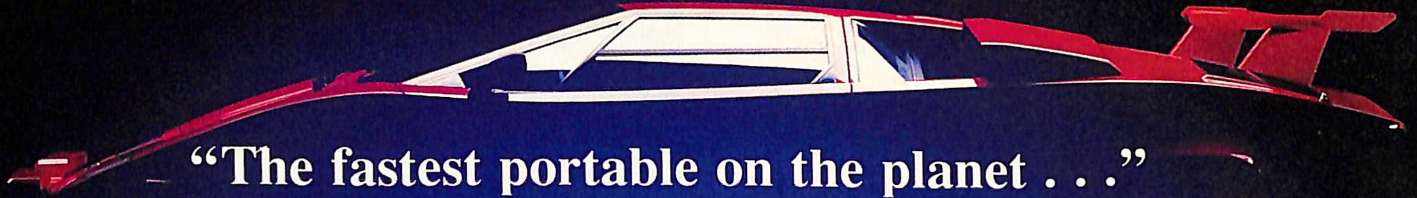

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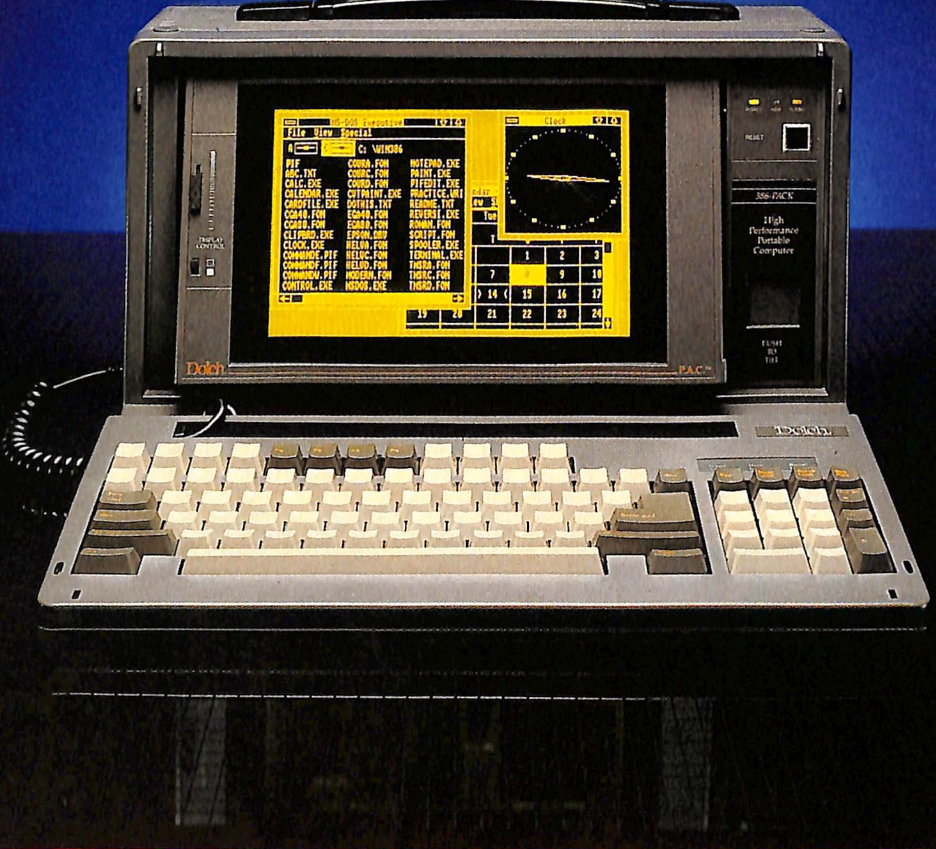

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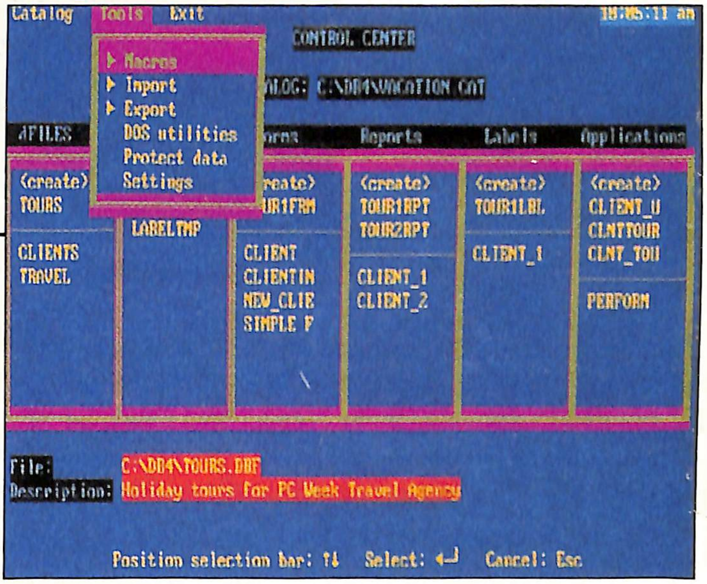
GUARDIAN DATA

Ten years of frenzy

It all started back in 1980 when, you guessed it, IBM was readying its Personal Computer. John Sterlicchi chronicles the events of the PC industry since *APC*'s inception a decade ago.

It's May, 1980. Two products were launched onto an unsuspecting public. One was the Apple III. The machine was grief-city. Just when Apple seemed to have the PC market screwed down it screwed up — leaving a gap big enough for a colossus. Enter IBM. The rest, as we insist on saying, is history.

The other product was Australian Personal Computer. Unlike the Apple III, it worked reasonably well from day one. Over the last 10 years APC has honed its act and faithfully chronicled the ebb and flow of products onto the market. To mark this auspicious anniversary, the powers that be at APC wisely decided against regurgitating those old stories and reviews. Instead they asked me to conjure up a very personal, personal computer history. Forgive any small memory lapses, and over the next 10 pages read vignettes on power, greed, stupidity, money and — oh yeah — technology.



ALOG: C:\DB4\VACATION.CAT

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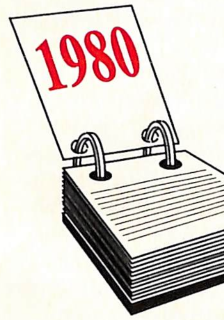
Description: Holiday tours for PC Week Travel Agency

The long-awaited and bug-ridden dBASE IV is often blamed for Ashton-Tate's net loss in 1989



Visicalc

I often wonder what would have happened to the spreadsheet market if Visicalc hadn't started to self-destruct in 1983, just as Lotus 1-2-3 was gathering speed.

Visicalc was the first ever spreadsheet. Its story began in 1978 when Dan Bricklin, a student at Harvard, hit upon the idea of developing a computer program to manipulate numbers. He constructed the program on an Apple II owned by another student Dan Fylstra. These two budding entrepreneurs decided to set up two companies — one to develop the software, Software Arts (Bricklin's), and one to sell the program, Personal Software (Fylstra's).

Visicalc hit the market in 1979, and sold some 700,000 copies before the world started to cave in in 1983. Bricklin claimed Personal Software (then called Visicorp) wasn't promoting Visicalc enough and tried to take back the marketing rights. Counter-suit followed suit and at one time two versions of the same product were on the market. One retailed at $250 and the other at $99. Not surprisingly, customers and dealers were confused, and both groups decided it was best to ignore Visicalc. They did, and troubles — and Visicalc — both went away.

Ashton-Tate

If Australia is the Lucky Country, then Ashton-Tate is the Lucky Company. In 1980, entrepreneur George Tate emerged from the obscurity of a computer repair business to acquire dBASE. The product had been developed — in his spare time — by aerospace scientist Wayne Ratliff, who didn't have the chutzpah to market it himself. Tate parlayed his good fortune into dBASE II (there never was a dBASE I) — a great product that made PCs useful.

Even Tate's death in 1984 couldn't stop the company's growth. By 1988, annual revenues peaked at $US307 million; profits fell just short of $US48 million; and the company employed 1700 worldwide. But then the luck ran out. A year later, 20 per cent of the lackeys had been given the boot and the company reported a net loss of $US28.6 million on revenues of $US265.3 million for 1989. The major reason for the disaster was, of course, dBASE IV.

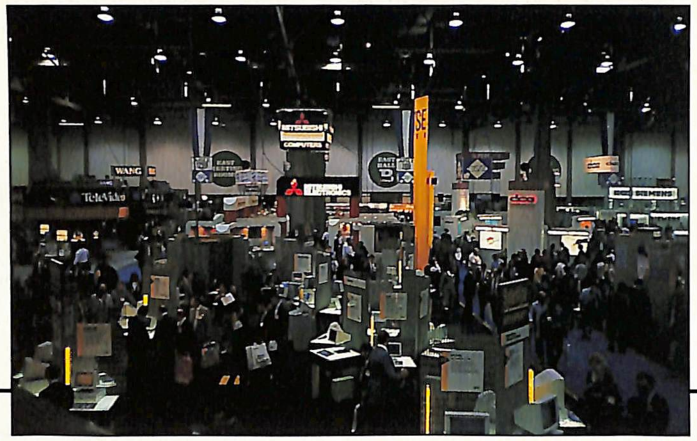
Not only was it late, but it was bug-ridden when it arrived. Somehow, Ed Esber has managed to keep his job masterminding one mistake after another, but if version 1.1 doesn't hack it, he will probably be long remembered as the CEO who threw it all away.

Kaypro

Who can forget those early Kaypro machines? You know the ones from a time before the word ergonomics was a pain in the wrist. The keyboard, monitor and CPU were encased in one unit. There was a time when Kaypro — then called Nonlinear Systems — was a real force in the computer business . . . in the days of 8-bits and CP/M. Even with the arrival of DOS in 1981, Kaypro prospered reasonably well as a clone maker.

The company was founded by Andrew Kay, a pioneer from the world of digital testing equipment. Kay brought half his family into the Silicon Valley setup, but as the company's fortunes plummeted over the second half of the decade, one by one they wandered off to new pastures.

It's been all downhill for Kaypro lately, and in March this year the company filed



You've never truly experienced a PC show until you have attended Comdex/Fall in Las Vegas

for Chapter 11 bankruptcy in the US. That doesn't mean Kaypro has gone out of business. It just means it can keep its creditors off its back while it re-organises. Kay is still there as a figurehead chairman, but the business is being run by a turnaround expert, who believes all Kaypro needs to get back on its feet is 'breathing room'.

CP/M

No retrospective of the PC business can be complete without mentioning CP/M. Its developer, Digital Research, went from high flyer to also-ran as soon as IBM decided to throw in its lot with Microsoft and MS-DOS.

I won't go into much detail here, as CP/M is discussed in 'Best products', but it is worth mentioning that Digital Research is still going, if not strong, well strongish, and it still keeps its hand in the operating systems arena with DR-DOS, an MS-DOS clone, which is sold with a multitude of Asian PC clones.

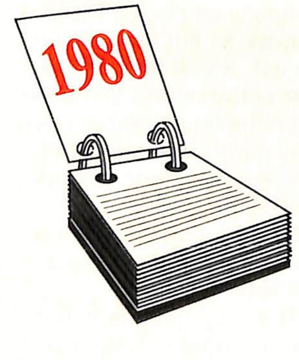
Comdex

Until you have visited Las Vegas in November and tried to walk around Comdex, you haven't really been to a PC show. No, I'm not deriding the shows in Australia sponsored by this auspicious publication, but it's just like comparing Jacob's Creek with Rosemount.

Comdex Fall was heading for its second appearance when *APC* was waiting to roll off the presses for the first time. Since then, each year around 100,000 of the faithful make their annual pilgrimage to the Nevada desert to find out what's really happening with PCs.

The show has changed over the decade. In the early days it was aimed at dealers, and techies dominated the attendees. Beards and corduroy flairs have long since given way to blue suits and white shirts as corporate buyers wave cheque-books. Comdex Fall is a phenomenon that has never been repeated — much to the annoyance of Sheldon Adelson, the man who created it. He's tried to replicate the show everywhere — even in Australia — without success. There is even a Comdex Spring, held in unattractive and cold Atlanta, but even that's more of a regional event than the worldwide extravaganza that takes place in Las Vegas.

In fact at Comdex Spring this year IBM has pulled out for the first time in ages . . . a definite omen for the future.



Osborne

People tell me Adam Osborne has mellowed after nearly a decade in the PC business limelight. It was in April 1981 that Osborne took centre stage for the first time when he launched the Osborne 1, the world's first 'transportable' computer. It was cheap for the day — only $US1795 — and became an immediate success selling about 100,000 units.

Osborne loved the limelight, but the bubble soon burst. The Kaypro II was a better buy and by September 1983, Osborne was shielding his face from photographers after his company had filed for Chapter 11 bankruptcy protection. He was back the following year with a new company, Paperback Software, but he never returned to his former glory. He quit Paperback — which is coming to the end of a legal battle with Lotus over its VP Planner spreadsheet — just a few weeks ago and is trying to raise funds for an AI company, Socrates. He is also manufacturing PC clones in India, where he was born.

The IBM Personal Computer

It's August 12, 1981 and little did we know that our whole lives were about to be turned around. That was the day IBM launched its personal computer. It wasn't considered much of a machine with its 16K of RAM and its cassette tape interface, but fortunately a handful of bright people out there saw the potential in desktop computing and rushed to work making hardware add-ins.

IBM, in its wisdom, had left five expansion slots in what it called the 'system unit' and software applications programs for what in those days was a relatively powerful 16-bit machine.

IBM had bestowed its blessing on Microsoft for the operating system and on Intel for the 8088 microprocessor. One hopes they are eternally grateful.

IBM's revolutionary Personal Computer, released to an unsuspecting world in August 1981

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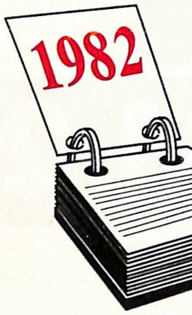

Hercules

Today we take graphics for granted, but back in 1982 we knew there was something missing. In August of that year, the Hercules Monochrome Graphics Card arrived. But it was only in the following year when developer Kevin Jenkins persuaded Lotus to include a software driver for the Hercules card with 1-2-3 that people began to sit up and take notice.

Dedicated 1-2-3 owners — except the wealthy few who could afford colour monitors — could for the first time see the program's graphics.

The Hercules board's graphics resolution, though only in green and amber, was better than twice that of IBM's Color Graphics Adapter. Pretty soon, al most all graphics software worked with the Hercules card, and by 1986, some 500,000 cards had been sold.

As so often happens, it wasn't long before there were clones of the Hercules cards, and some systems cloners included the card clones in the total package.

Time

There was plenty going on in 1982. Important things. Brezhnev died; Isreal's Begin invaded Lebanon; Thatcher did likewise in the Falklands; ET arrived and I got married. *Time* magazine, which for the previous 55 years had chosen its Man of the Year, changed its tune. Instead, in 1983, The Man of the Year, became the Machine of the Year.

The *Time* articles contained examples of how real people were using computers — a novel editorial concept often forgotten by publications today. There were interviews with 'Maestros of the Micro'. Steve Jobs was there of course. There was also my favourite, Clive Sinclair, who parlayed brilliance, eccentricity and street-savvy into a few million quid by producing the ZX computers that were almost impossible to use because they were so small.

Tandy

While Osborne and Kaypro take the honours for having the first 'transportables', those two looked like real clunkers when Tandy launched what could take the title of the first laptop. Complete with a decent eight-line LCD screen, the Model 100 was launched in March 1983.

I remember magazine reviewers loving the machine, because it was ideal for journos as they travelled hither and thither. However, Joe Public was none too impressed by the machine — it probably had a lot to do with the screen and the lack of DOS compatibility. That lack of success was a blow for Tandy, which strived throughout the decade to be taken seriously as a vendor of high-quality PCs. Its latest try was just a couple of years back when it announced it would be the first company to clone the PS/2 complete with MCA. It's a long hard road.

TI-99/4

It was a bleak day for many in October 1983 when Texas Instruments decided it had had it with the home computer market and dumped the TI-99/4. The company had sold mega-quantities of the machine but had forgotten a golden rule of business . . . you need to sell your product for more money than it costs to make!

More than six years later, the computer is neither gone nor forgotten. There are user groups galore all around the world and a year or so ago I discovered that two Australians were doing their bit to keep users happy and productive. University of Newcastle physics professor, Tony McGovern, and his 16 year-old son Will, created Funnel Web, a word processing package named after the infamous spider. At the time, one enthusiastic US user told me that the latest version, Funnel Web 4.0, was the most single important programming effort that's been produced for the TI. Another said, "Funnel Web is the king of the TI word processors."

The early days of the personal computing business attracted an oddball group of devotees — I'll never forget being crushed at shows in London which were crammed with people who owned the tiny Sinclair ZX computers — and because of their efforts, the relics of those bygone times are being preserved.

PCjr

One industry that really benefited from the PC revolution, as some call it, was the magazine business. With the notable exception of the Computerworld organisation, computer magazine publishing at the start of the 1980s was pretty much a parochial affair. But as more people bought PCs they demanded more and more information and add-on products. With consumers wanting both editorial and advertising they couldn't help selling magazines and loads of advertising.

At the time *APC* was coming into being in Australia, publishers all over the US

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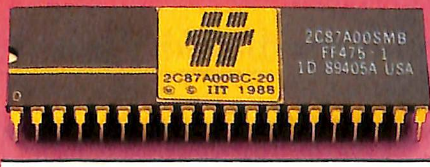

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	2C87-12 (12MHz)	(replaces 80287-12)
	2C87-20 (20MHz)	(not avail. from Intel)
80386SX Computers	3C87SX-16 (16MHz)*	(replaces 8037SX-16)
	3C87SX-20 (20MHz)*	(replaces 8037SX-20)
80386 Computers	3C87-20 (20MHz)	(replaces 80387-20)
	3C87-25 (25MHz)	(replaces 80387-25)
*Available June 1990	3C87-33 (33MHz)	(replaces 80387-33)

- The 2C87 (80287 compatible) includes all the instructions added by the 80387, as well as a new instruction that vastly speed up 3-D graphics.
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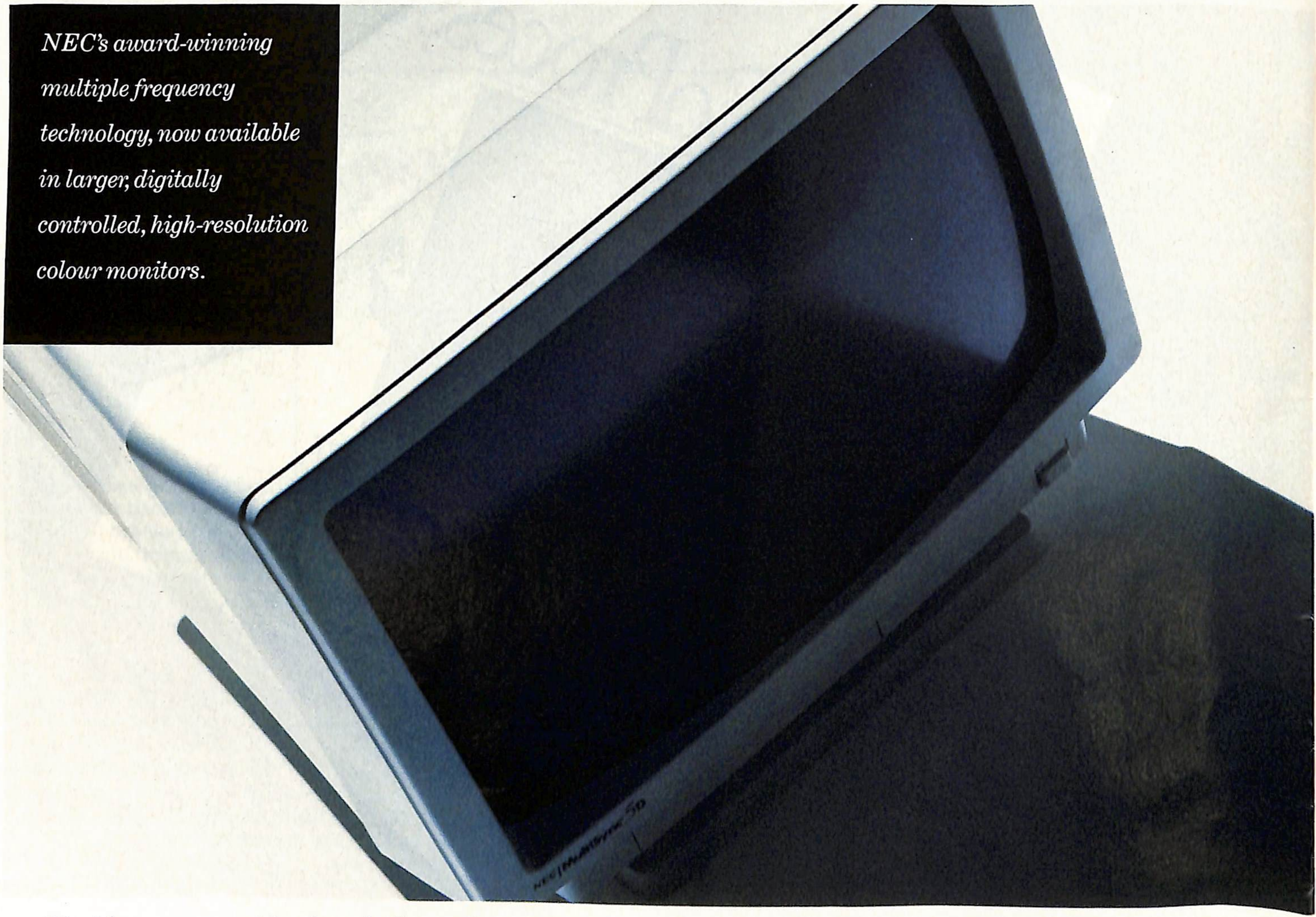

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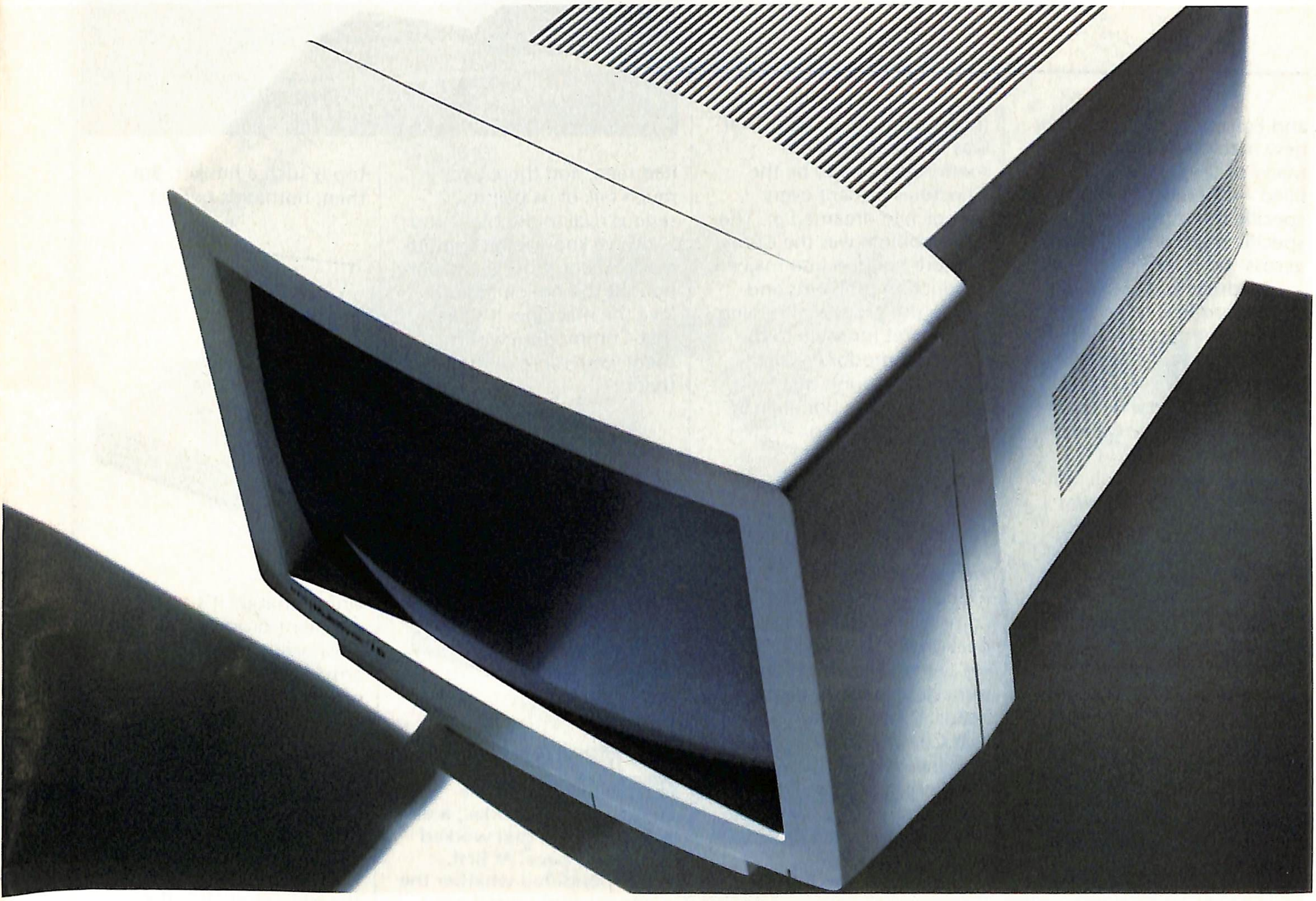

The main difference: one is for large ideas. The other, for extra-large. For literature on a full range of NEC MultiSync monitors (2A, 3D, 4D, 5D), call Sydney 868 1811. Melbourne 544 9200. Brisbane 277 0888. Adelaide 294 9033. Perth 445 3499.

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NEC

NEC Home Electronics Australia Pty. Ltd.

Apple has come a long way since the release of its first Mac in 1984. Last year, the company released its first portable

and Europe were looking for new markets. Come 1983, many of the niches were filled — there were industry specific mags, machine specific mags and, of course, across-the-board mags.

A launch in November 1983 promised to bring another bonanza to publishers. IBM announced its home computer, the PCjr, which everyone believed would be bought by families galore. Publishers had their magazine ready to roll, but guess what? The PCjr was a major, and I mean major, flop. The Peanut, as the machine was code-named, was well and truly roasted by all and sundry. With only one disk drive, game cartridge slots and an unusable keyboard, the PCjr proved IBM didn't have a clue when it came to the home market.

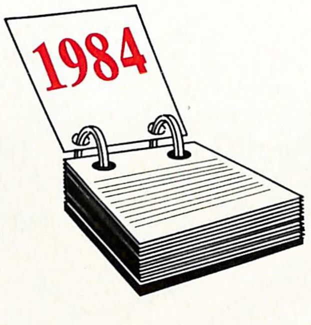
Commodore

Who in the PC business can forget Christmas 1983. That was the year the Commodore 64 was to be the Christmas present every schoolchild dreamed of. The only problem was the Commodore had run into major production problems and was in the process of ruining the market for itself. In the end, Commodore's sales boomed through that period, but the bubble had burst the following Christmas.

In January 1984, feisty Commodore boss Jack Tramiel quit and moved over to Atari. In 1982 and 1983 we were talking about Commodore as being one of the computing giants of the decade. By the end of 1984, we saw inventory and long-term debt, and shook our heads. It was in that year that Commodore made a wise investment by buying a small private Silicon Valley Company, Amiga Corp. The Amiga had already garnered respect from the few who had seen, and there was much talk of its being a serious rival to the Macintosh.

As we know it never quite made it. But those users who bought the Amiga tend to love the machine. It's just that Commodore wishes there were more of them out there.

The Commodore Amiga never reached its aim of rivalling the Macintosh



The Macintosh

In January 1984, Apple launched the first Mac, a one-drive machine that worked at a snail's pace. At first, critics pondered whether the company had scored an ignominious hattrick as the Macintosh followed the Apple III and the Lisa on to the market. But just enough people bought the machine to keep the concept alive.

For all of us out there who stopped using the Mac, it's incredible to read that a couple of months ago Apple launched the Macintosh IIfx . . . a 40MHz speedster. There are a couple of other incredible things about the Mac. First, it's incredible that there is no reasonably-priced entry-level machine and second, that the so called laptop is such a hunker. But then, nothing's perfect.

Compaq

Unfortunately it's not for its excellent products that I will always remember Compaq's arrival in Australia. Now as most of us know, Sydney is a cultural desert, and that's what the locals like — as proved to be the case when Compaq decided to launch its Australian subsidiary at the NSW Art Gallery in 1985. There was a wonderful Turner exhibition on at the time, and after the wining, dining and speechifying, all and sundry were invited to view the old masters. Hardly anybody bothered . . . and I don't think it was because they had done so earlier.

Compaq, which was incorporated in 1982, and shipped its first product the following year, has come a long way from the time its founders outlined their plans for a portable on a napkin. That sketch convinced ace venture capitalist Ben Rosen to organise financing for the idea. The company has al-

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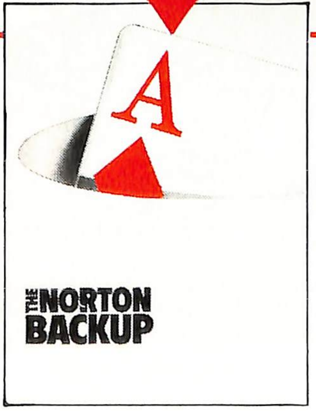

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ways released leading-edge products — though too expensive for my needs — and is now exerting a remarkable amount of influence on an industry in which it has a relatively small marketshare.

Compaq president, Rod Canion's best moment though, was when he compared IBM's PS/2 series to New Coke — a reference to the disastrous attempt by the kids at Coca Cola to fix something that wasn't broken.

Pirates

Will the software business ever get rid of product piracy? Who knows? Who cares? I'll never forget August 1985 when *APC's* sister paper, *Computing Australia*, rolled off the presses for the first time with a picture of an intrepid bunch of pirate hunters on the front page. These Aussie heroes had been to Hong Kong where, with the able-bodied assistance of the local authorities, had pounced on pirated product purveyors in the world-famous Golden Arcade.

The piracy war is still on, and there are now a number of international organisations trying to stamp it out at a corporate level. I'm always reading about software busts in various banks and merchant houses in quasi-third world countries. In fact, I even think there was one in New Zealand recently!

Of course, the one way to end software piracy is to give software away. And that is what an organisation called the Free Software Foundation is all about. Richard Stallman and some students at MIT are putting a whole environment and applications together to simply give away. Stallman is obviously more of a man of the 70s than the 80s.

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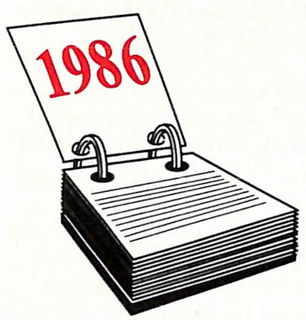


Lotus

To think of Jim Manzi's smug look as it stares at me from the cover of *Businessweek*, which proclaims that the CEO of Lotus is the highest paid executive in the US, still makes me cringe three years after the event. Manzi had inherited his job in July 1986 when Lotus founder Mitch Kapor finally realised he didn't like heading up a big company, but preferred the life of an entrepreneur. Manzi managed to run the company successfully — or so he thought — through 1987 and paid himself around $26 million for his efforts.

After that it was all downhill for Manzi. Lotus failed to deliver 1-2-3 Release 3.0 the following year and his and the company's reputation plummeted. Manzi did have the sense to recruit an ex-IBMer to sort out the mess, and this year the company has bounced back with a whole swag of new products.

When the Lotus takeover of Novell goes through, it will be interesting to see how he manages in Bill Gates' former role as head of the world's biggest software company. Manzi and Raymond Noorda keep talking about the synergy between the companies. I've yet to see it. I reckon it's just an ego trip. As to the Lotus flagship product, 1-2-3 for the PC, its various versions are back where they have been since 1982 . . . at the top of the best seller lists.

IBM PC Convertible

Considering it has long led the way in desktop computing, IBM has made its share of mistakes. Remember the PC Convertible? What a loser. The machine never sold in large quantities because it weighed what seemed a ton, and anyway, Compaq had better machines.

With the Convertible, IBM did give us plenty of warning as to where disk drives were going. The machine had 3.5in drives and the prediction then was that 5.25in would go the way of the 8in. It will, but not that quickly.

Desktop publishing

The year 1986 was a great one for personal computing. It was the year that we discovered desktop publishing. Xerox launched Ventura for the PC that year after the Macintosh/LaserWriter combo had spawned the fledgling industry the previous year.

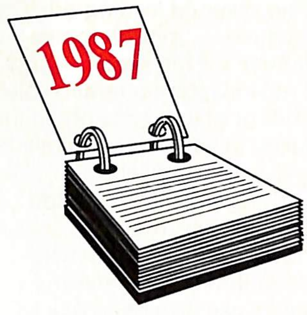
The term desktop publishing was coined in October 1984 by Paul Brainerd, of Aldus PageMaker fame. But it was not until 1986 that the world at large caught on and a whole bunch of 'Technology Trend' and 'Innovation' articles on the subject began appearing. A little doubt crept in though, in September 1986, when that well-known guru Steve Jobs predicted DTP would disappear. "This is a $600,000 event to talk about a non-existent market in two years," he said. Right on Steve.

Xerox

Now, there's a name you don't associate with the PC hardware business. Xerox though, could have had it all. It's generally acknowledged that Xerox built the first PC, circa 1976. It was, in fact, one of the first companies to come up with a PC clone in 1981. It manufactured its own machines in the beginning, but then relabelled computers made by Olivetti and Toshiba.

Xerox pulled out of the general PC business early in 1987 to sell PC compatibles as part of a hardware/software package with its successful DTP package, Ventura. The company found it could not compete with the low-priced Asian clones.

It wasn't just with hardware that Xerox blew it. It was at Xerox's Palo Alto Research Center (PARC) that Steve Jobs saw the engineers working on graphical menus, which Apple later successfully incorporated into the Mac. When Xerox tried to sell commercially the same technology as Star, it again failed miserably. Recently, Xerox has tried to sue Apple over the GUI, but the latest betting is that the corporation is again onto a loser.



PS/2

IBM's launch of the PS/2 range on April 2, 1987 was almost as inauspicious as the launch of the original PC some five years earlier. This time though, no-one was unimpressed by the technology. It was just that IBM had a swag of competitors, up to their eyeballs in AT investment, who called the PS/2, with its proprietary Micro Channel architecture, a complete waste of space. True, IBM did make mistakes. The corporation with its first PS/2 models abandoned the AT bus entirely only to realise that it was not going to work . . . so it had to rectify that one.

IBM broke a long-standing corporate policy during the pre-launch hype. With the PS/2 it was difficult to keep quiet man-in-charge William Lowe. Even after the roll-out, Lowe was Mr Quotable as he happily disseminated PS/2 sales figures to quell dissenters . . . release of sales information was also previously forbidden at IBM. All Lowe's talk was not enough to save him though. The PS/2, at the beginning, was underwhelming, and

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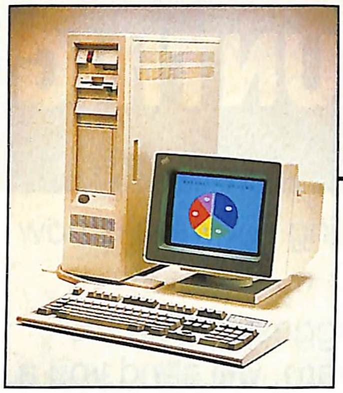


IBM competitors originally tagged the PS/2 range as a waste of space

Lowe, realising his path to the top was probably permanently blocked, took his talents off to Xerox, where for the last couple of years he has kept a low profile. It can't last.

Tracker

Over the last 10 years, a number of Australian developers tried to make it in the US with varying degrees of success. Typequick and Magician are a couple that spring to mind. Undoubtedly though, the most controversial launch was that of Tracker, a database package for keeping track of clients and prospective clients.

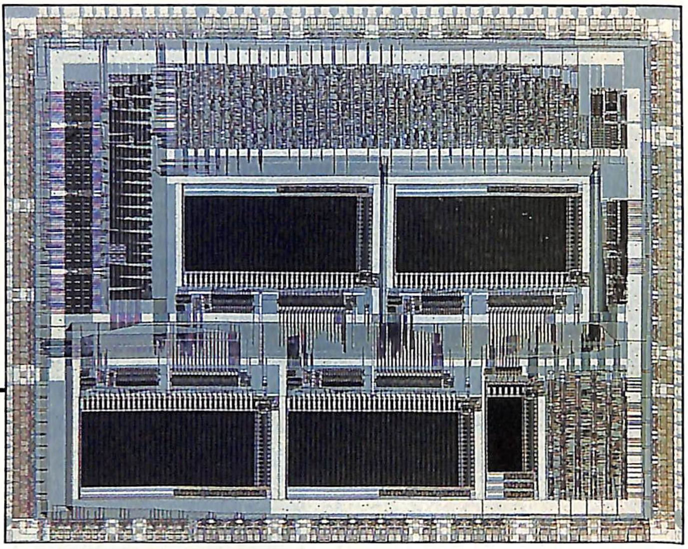
Melbourne-based Adaptive Electronics used a stunning photograph of an aborigine for marketing purposes and found friends and foes. On the one hand, at a 1987 Comdex trade show, Adaptive won the International Press Association's Award for design, performance and packaging. But, only a few months later, the company received a dishonourable mention in the annual Badvertising Report in the US publishing trade magazine, *Adweek.* The controversy was probably good for business but, on the whole, Aussie developers found it tough going to tap into the massive US market.

Austek

Can a real Aussie high-technology company make it against the big boys on the worldwide field? That's a question I've often asked myself, and I'm afraid I still don't know.

Austek, which keeps its designers in Adelaide, but has its corporate headquarters in Silicon Valley, has, the company assures me, an excellent product in its cache memory controller for Intel microprocessors.

What's a cache memory controller, and why is it important? Chips such as Intel's 80386 are used as a system's central processor because they are very high speed. Unfortunately, high speed equals high cost. So, to keep down the price of systems, manufacturers are using cheaper, slower Dynamic RAM (DRAM) chips in main memory. Appeasing users who don't like the slowness of access to main memory, the 386 systems can have a cache subsystem. That subsystem will retrieve data from the large, slow main memory, and store it temporarily in a small cache data memory, in order to make it more quickly available to the central processor. Austek's cache controller manages that cache activity. I've been bumping into Austek selling its controller — and others — since 1987. It's a private company, so Austek won't tell me how well or how badly it's doing. Let's hope for the best.



The industry's highest performing integrated cache controller, the Aussie Austek A38202

MCA vs EISA

Ever heard of a silicon barbecue? No? Well, it's an event described by an IBMer to demonstrate the perils of EISA. As you are no doubt aware, EISA stands for Extended Industry Standard Architecture, and it is the arch enemy of IBM's MCA (Micro Channel architecture). The pros and cons of MCA and EISA have taken up quite a lot of column inches in the last few years.

It all started when IBM announced the PS/2, and promised us that MCA would pave the way to multitasking and wonderful communications. A 'Gang of Nine' angry PC clone vendors were furious, and said MCA was nothing more than a proprietary device from IBM to stop its disastrous loss of market share. The Gang came up with EISA which, according to its proponents, has the advantage of being backwards-compatible to the PC AT. EISA has finally arrived, and the battle is now going strong.

As for a silicon barbecue — that, said the man from IBM, happens when you mix AT cards with EISA cards as the Gang say you can do. Quote: "What the user would see is the two devices getting very hot. Eventually one would burn out. And that's what we call a silicon barbecue."

Intel: thoughts of a chairman

Grove, circa 1988. "The reason the US is going down the toilet is because companies have taken all the blue collar manufacturing jobs to Asia, where labour is cheaper."

"Well Chairman Grove, does that mean Intel is going to open factories in the US and close down the ones it has in Asia?"

"Certainly not."

Andy 'Mr Integrity' Grove is in charge of an Intel corporation that has prospered because of the support IBM and the compatible manufacturers gave throughout the decade to its X86 chips. It is repaying that customer loyalty by, in addition to selling

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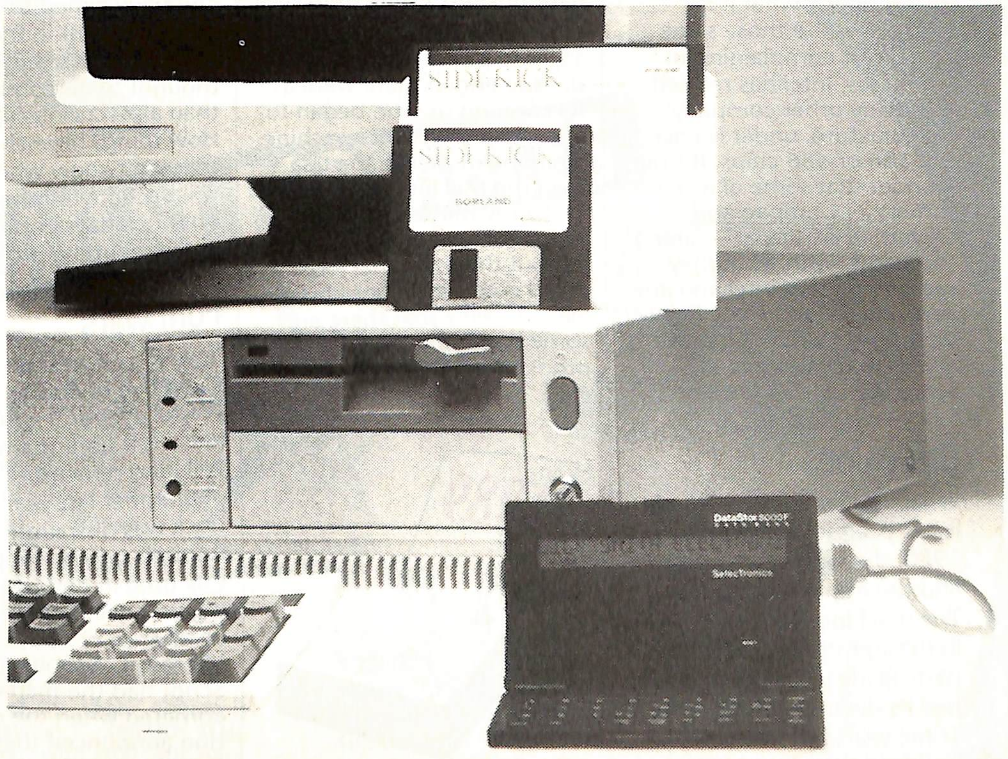

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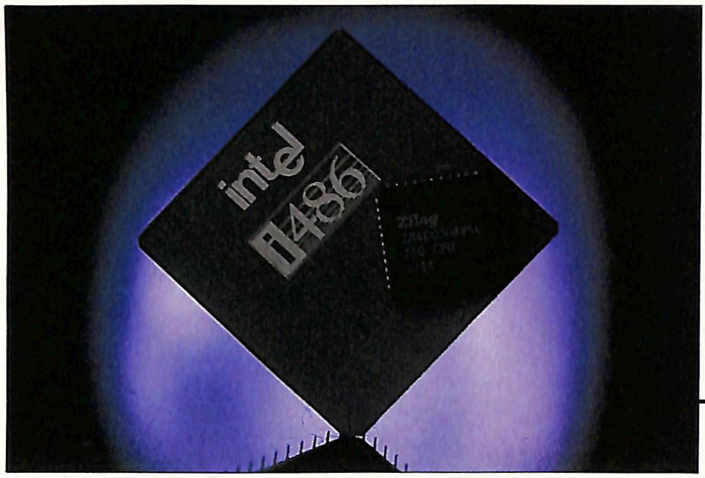


Intel-style chips then and now . . . an enhanced clone of the 8008 (Zilog's Z80) and Intel's latest, the i486

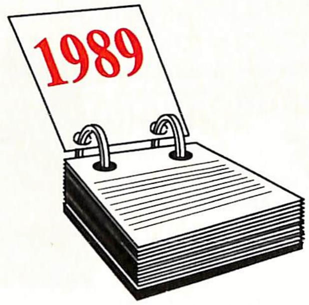
chips, selling complete systems in competition to the customers who helped make the company what it is today. Despite those same customers complaining of shortages, Intel has refused to let any other company manufacture, under licence, the 386 or 486 chips. It's no wonder that some of its customers — Compaq and Olivetti in particular — aren't too happy with what they see going on at Intel and are spraying around some heavy duty bucks to come up with an alternative source of processor.

Steve Jobs

What a roller coaster decade it has been for Steve Jobs. In 1980, the world loved him and the Apple II computer. The machine was selling well in the strangest of places, particularly in France and it had its devotees in Australia. Three years later, he announced the Macintosh, which initially looked like another Apple mistake, and just 12 months afterwards he was out on his ear after losing a power struggle with John Sculley.

From that time until October 12, 1988 we all watched, waited and wondered what Jobs would do for an encore. On that day we found out when the NeXT Computer was launched with the subtlety of a sledgehammer. Centrestage was Jobs and a black magnesium, Motorola 68030-based workstation running Unix. That was probably the last really good day Jobs has had. Delays with the NeXT operating system slowed sales through 1989 to a trickle. As the decade ended there were a few among us who began to think that the NeXT machine could be more like the Lisa than the Macintosh.

To my mind though, it is much too early to start counting out the mercurial Jobs. Word is coming out of his Silicon Valley that there are some pretty exciting products on the way.



RISC

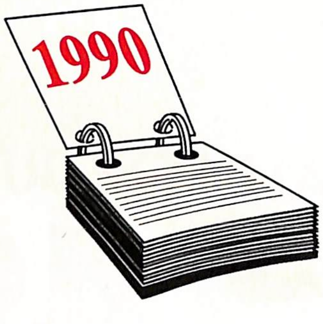
Technologies have come and gone in the last 10 years. One that came to the fore late in the 1980s but will play a big influence this decade is RISC, Reduced Instruction Set Computing. Hewlett-Packard has been a long-term devotee of the technology that allows processors to operate more speedily, but it's interesting to see that it's newish companies that are in the vanguard.

Sun and MIPs are two major players out to set the standards. I remember smiling, back in 1987, when a Sun director said that the company aimed to be the second largest in the computer business. Sun was then thought to be nothing more than a precocious upstart. How things have changed. I still don't know whether it will become number two . . . but nowadays nobody's laughing at the prospect.

Font wars

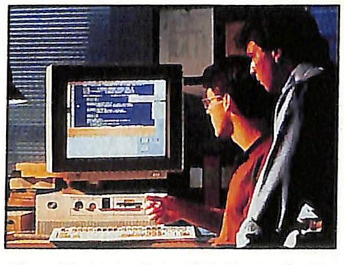
Seeing John Warnock, chief executive of Adobe, with tearful eyes and a trembling voice is a sight many people will long remember from September last year. Warnock was distraught because Adobe's grip on font technology used in desktop publishing was being challenged by an alliance of Apple and Microsoft. Adobe with PostScript had the market cornered when the dastardly duo announced they were going to develop their own technology — now called TrueType — which they said, with modesty typical of the pair, would become the industry standard.

It was no wonder Warnock was near to tears as he made the announcement that Adobe would place the closely held complete specifications for Adobe into the public domain so other vendors could license them and develop products. To many observers it looked as though Adobe was on its last legs, but since those fateful days the company has made a bit of a comeback, which crescendoed in March when IBM announced it would use Adobe's font technology across all its SAA (Systems Applications Architecture) machines. Warnock may be a bit of a wimp, but you can't keep a good technology down.



RS/6000

It's pretty embarrassing. IBM scientists invented RISC technology, but the only way in the 1980s the giant corporation made any money out it was from licensing fees from other manufacturers who had incorporated RISC in their products. IBM couldn't get a RISC-based product out the door. All that ended last February when Big Blue



The RS/6000 is IBM's ticket into the workstation arena

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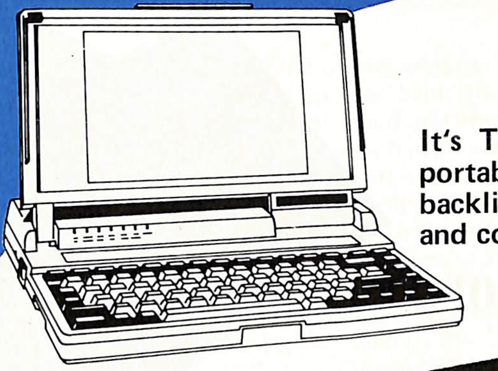

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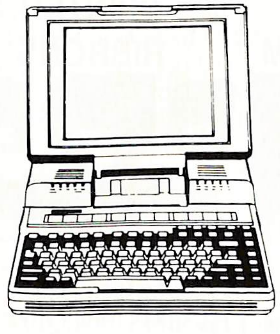

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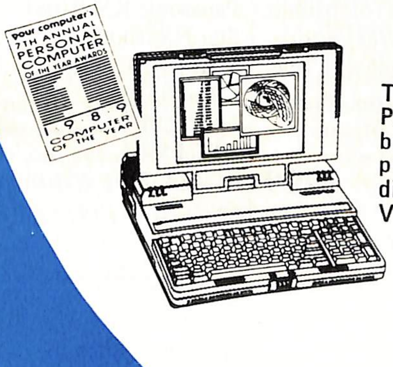

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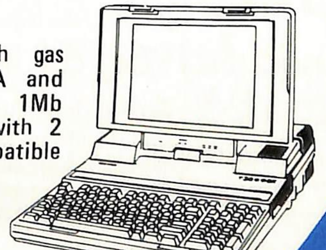

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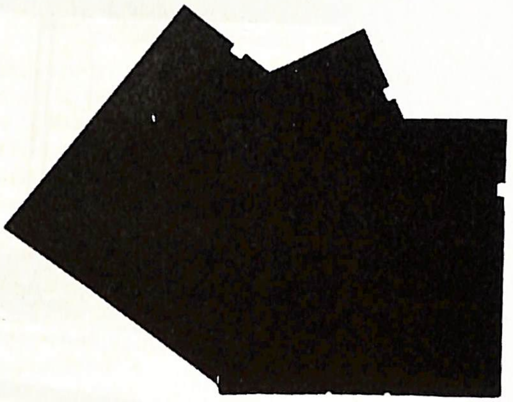

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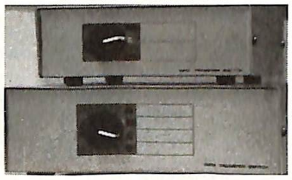

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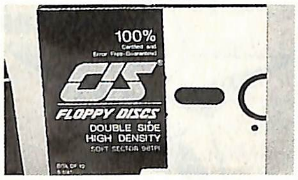

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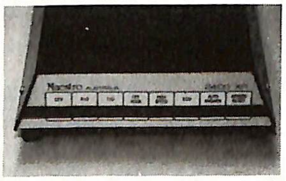

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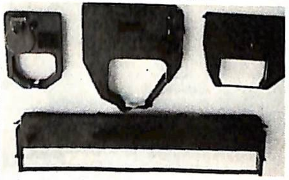

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launched RISC System/6000 . . . to rave reviews. At long last IBM threatens to become a legitimate player in the workstation arena and will give Sun, DEC and HP/Apollo a good run for their money.

The strength of IBM's products to my mind, vindicated Tom Vanderslice's decision to sell Apollo to HP rather than become number five in the field. A lot of people thought he was premature at the time, but his decision has proved to be the right one. Sun and DEC knew they were in for a real challenge when at the RS/6000's launch shendig, IBM did a demo in which the Model 320 did a Linpack test more than twice as fast as a Sun SparcStation 330 and more than three times as fast as a DECStation 3100.

Unix

Ever since OS/2 came onto the market, pundits and market research types have said it would be the operating system of choice by the late 1980s and early 1990s. Wrong. Little did they realise that it might not be in some power users' interests to have a more powerful operating system, and it doesn't suit some important vendors. For example, what would happen to Microsoft's investment in Windows?

Also the pundits, until say early last year, continually rubbished the Unix operating system. This was despite the fact that Unix has some very powerful allies, notably the US Government and the European Commission. Both organisations have standardised on Unix. With the mega-users lined up behind Unix, I've been baffled why it has always been so unpopular in pundit polls. Maybe, like me, those asked always lie to pollsters as a matter of principle.

Unix on PCs has pretty much been ruled by the Santa Cruz Operation's Xenix and now SCO Unix developments. You might be surprised to learn that Microsoft owns equity in SCO, which reputedly has around 85 per cent of its market. Unix, a product that would have merited a mention in a column about the 70s, is very much alive and well as we steam into the 90s.

Litigation

Lawyers have had a field day throughout the decade. The few quid I have contributed to their coffers because of a couple of — to me — innocuous comments, is a mere byte in a giga compared to what these fine folk have reaped elsewhere.

As an observer, I see very little wrong in most litigation for two reasons. One, it makes good copy and two, I believe original work covered by patents and copyright should be protected. I thought IBM firing letters off to all and sundry to protect its XT and AT trademarks was a little over the top. 'Look and feel' lawsuits were definitely children of the 80s. Lotus, I believe, is about to win its case against two smaller spreadsheet imitators; Ashton-Tate's attempt to bamboozle Fox is less clear cut; and who knows how Apple's silly claims against Microsoft and HP will finish.

Least we forget Apple suing the others for use of a similar graphical user interface — a technology it 'borrowed from Xerox' . Xerox's claims to the GUI technology, though, will hardly be tested in the courts because the company filed too late. Apple has built a reputation for litigiousness throughout the decade, which included a long drawn out fight with Australian Michael Suss from Computer Edge over . . . an Apple II compatible, otherwise known as the Wombat. All the rage with US lawyers at the moment is something called 'class action suits', where a bolshy shareholder claims to represent all the others and sues a corporation for millions claiming ineptitude whenever the share price tumbles. Lawyers for

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these obviously fair-minded watchdogs usually try and settle out of court . . . in what is the latest version of green mail. It's become so bad that Al Shugart, the boss of Seagate, is trying to form an organisation called Enough is Enough, after Seagate was sued when the share price went up! The suit alleged Shugart kept good news to himself while he and fellow executives bought stock at depressed prices.

John and John

Two men called John lead chief protagonists IBM and Apple as we end this decade of discovery. John Akers became president of IBM in 1983, the same year as Apple lured John Sculley from the Pepsi Cola Company. Both men assumed chairmanship of their respective companies in 1985.

For Akers, it has been a tough time. I'm one of the many people who wonders how he has kept his job. He has presided over amazing decline in growth and stature at IBM that has had investors howling for years. He's seen the company's pre-eminence in the PC marketplace whittled away by a bunch of upstarts, led by entrepreneurs still in nappies when he was beginning his career. He's recently watched the share price fall below $100 — and still he's kept his job. Word has it though that IBM is, in the next year, going to be hit where it hurts most — in its mainframe sales. If that happens maybe then it will put Akers out of his misery.

Sculley's story is generally more upbeat. He took full control of Apple in 1985 when he ousted co-founder Steve Jobs in a power struggle. The board of directors who backed Sculley did the right thing because Jobs was so obsessed with making the Mac perfect he just wasn't getting enough to market. Sculley changed all that. The emergence of DTP and faster Macs, mixed with some anti-IBM dominance sentiment and some excellent marketing, saw Sculley rejuvenate Apple.

Sculley could have gone down in history as the greatest turnaround artist of all time, but he's started to slip. He's forgotten he's a marketer and thinks he's a visionary. He's even made crucial personnel decisions, the worst of which was to promote a man with no sales and marketing experience to head up the vital US organisation. Poor Allen Loren bombed; Jean Louis Gasseé quit and morale at the company is pretty low. Sculley could well bounce back though. It's rumoured he's appearing at his office occasionally, and presumably is 'doing things' as opposed to having 'great thoughts'.

LANs

Every year since about 1987 someone, somewhere has written 'this is the year of the LAN'. I think I wrote it myself at the beginning of 1989. Because LANs are a supposedly hot topic, we tend to think of the concept as relatively new. Unfortunately for vendors — and customers who pay the additional costs — the concept of Token Ring, for instance, goes back to the mid 1960s.

A man named oLaf Soderblom invented a technique of arbitrating access to the transmission medium via passing an order character or 'token' between networked stations. Soderblom patented his discovery, and since, he has reaped major royalties from all and sundry. His patent is once again being challenged in the courts, but the betting is he will remain a wealthy man. A whole potful of new money is coming his way from vendors using something called FDDI (Fibre Distributed Data Interface), which is an up and coming technology that will undoubtedly be a milestone development worth writing about in another 10 years time.

END

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MAY 1980

Volume One, Number One

Ian Davies takes us for a random access meander down memory lane and recollects what *APC* and the state-of-the-art were doing 10 years ago today.

Scenario: Richard Strauss' Thus Spake Zarathustra resounds mightily; an unkempt Ape Man tosses a bone into the air, thereby sussing out a great truth and setting the whole development of the human race in train. The Dawn of Man has broken. The bone turns into satellite, and the imagery is epic.

Ten years ago, an event of no less significance enacted itself. For slightly unkempt Ape Man, substitute publisher. For ape-gnawed bone, substitute magazine. Delete Strauss, insert monotone square-wave. For Dawn of Man, replace with birth of the Australian PC industry.

Most right-thinking people acknowledge that APC's spurting impact on the fledgling Australian computer industry was foretold 15 years before it happened, by the pictorial parables of Kubrick and Clarke's 2001: A Space Odyssey; but I thought I'd point it out anyway.

The really remarkable bit is that of the two allegorical centerpieces in each story (APC and the ape-chewed wilderbeast bone), neither has yet to crash back to terra firma. And in both, the computer went wild and tried to make a killing.

Looking back over Volume 1, Number 1 really brings home just how we've all moved along in the intervening decade. Most noticeably, May 1980 was before the legitimisation of the microcomputer. All the big players of today — IBM, NEC, Olivetti, NCR and DEC were yet to get involved. Many of today's major leagues, such as Amstrad and Compaq, were yet to exist. The exceptions are few: Commodore was big with the PET, and now does well with its range of clones and the Amiga; and Tandy was ultra mainstream, and now just runs a fleet of clones like everyone else. The big exception, of course, is Apple which 10 years ago was fiddling around with fairly dull Apple IIs and went on to spearhead a whole new off-shoot in the form of the Lisa and Mac.

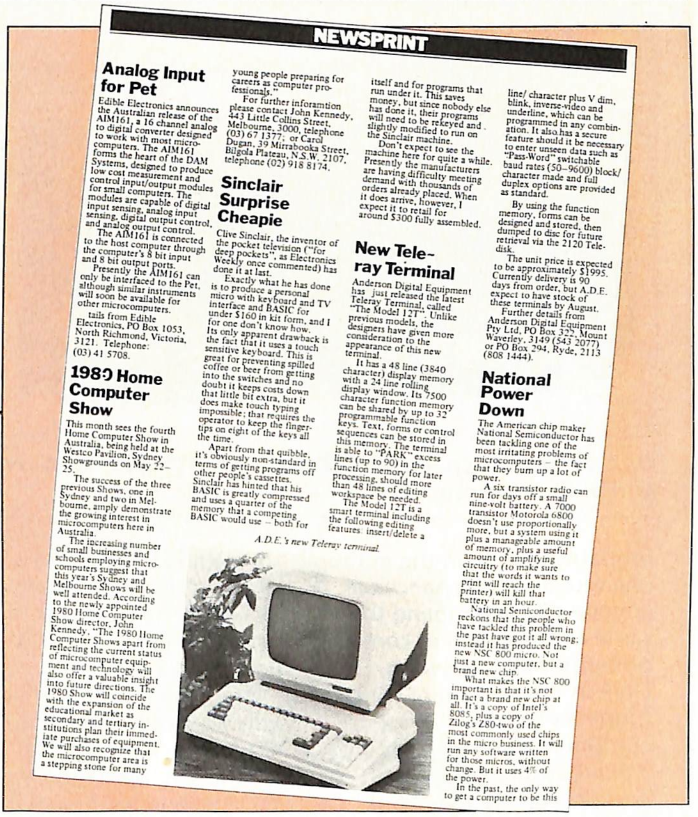
And now, the news . . .

APC of 1980 had a Newsprint section just like its modern equivalent. And how revealing the news is!

The lead story is an analogue-to-digital interface for the Commodore PET. Close behind it is advance warning that Clive Sinclair might be about to enter the low-cost micro market. This, believe it or not, was the harbinger of the ZX-80. Hands up everyone who can remember Clive Sinclair! Hands up all those who still use a ZX-80 to wedge the back door open!

Also in the news that month, was this rather exciting product: a dumb terminal with automatic scrolling, insert/delete capability, blinking, underline and capable of running at up to 9600 baud. Pretty amazing stuff, and all for just $1995 with a 90-day delivery

MAY 1980



NEWSPRINT

Analog Input for Pet

Edible Electronics announces the Australian release of the AIM161, a 16 channel analog to digital converter designed to work with most microcomputers. The AIM161 forms the heart of the DAM Systems, designed to produce low cost measurement and control input/output modules for small computers. The modules are capable of digital input sensing, analog input sensing, digital output control, and analog output control.

The AIM161 is connected to the host computer through the computer's 8 bit input and 8 bit output ports.

Presently the AIM161 can only be interfaced to the Pet, although similar instruments will soon be available for other microcomputers.

tails from Edible Electronics, PO Box 1053, North Richmond, Victoria, 3121. Telephone: (03) 41 5708.

1980 Home Computer Show

This month sees the fourth Home Computer Show in Australia, being held at the Westco Pavilion, Sydney Showgrounds on May 22–25.

The success of the three previous Shows, one in Sydney and two in Melbourne, amply demonstrate the growing interest in microcomputers here in Australia.

The increasing number of small businesses and schools employing microcomputers suggest that this year's Sydney and Melbourne Shows will be well attended. According to the newly appointed 1980 Home Computer Show director, John Kennedy, "The 1980 Home Computer Shows apart from reflecting the current status of microcomputer equipment and technology will also offer a valuable insight into future directions. The 1980 Show will coincide with the expansion of the educational market as secondary and tertiary institutions plan their immediate purchases of equipment. We will also recognize that the microcomputer area is a stepping stone for many young people preparing for careers as computer professionals."

For further inforamtion please contact John Kennedy, 443 Little Collins Street, Melbourne, 3000, telephone (03) 67 1377; or Carol Dugan, 39 Mirrabooka Street, Bilgola Plateau, N.S.W. 2107, telephone (02) 918 8174.

Sinclair Surprise Cheapie

Clive Sinclair, the inventor of the pocket television ("for deep pockets", as Electronics Weekly once commented) has done it at last.

Exactly what he has done is to produce a personal micro with keyboard and TV interface and BASIC for under $160 in kit form, and I for one don't know how. Its only apparent drawback is the fact that it uses a touch sensitive keyboard. This is great for preventing spilled coffee or beer from getting into the switches and no doubt it keeps costs down that little bit extra, but it does make touch typing impossible; that requires the operator to keep the finger-tips on eight of the keys all the time.

Apart from that quibble, it's obviously non-standard in terms of getting programs off other people's cassettes. Sinclair has hinted that his BASIC is greatly compressed and uses a quarter of the memory that a competing BASIC would use – both for itself and for programs that run under it. This saves money, but since nobody else has done it, their programs will need to be rekeyed and slightly modified to run on the Sinclair machine.

Don't expect to see the machine here for quite a while. Presently the manufacturers are having difficulty meeting demand with thousands of orders already placed. When it does arrive, however, I expect it to retail for around $300 fully assembled.

New Teleray Terminal

Anderson Digital Equipment has just released the latest Teleray Terminal, called "The Model 12T". Unlike previous models, the designers have given more consideration to the appearance of this new terminal.

It has a 48 line (3840 character) display memory with a 24 line rolling display window. Its 7500 character function memory can be shared by up to 32 programmable function keys. Text, forms or control sequences can be stored in this memory. The terminal is able to "PARK" excess lines (up to 90) in the function memory for later processing, should more than 48 lines of editing workspace be needed.

The Model 12T is a smart terminal including the following editing features: insert/delete a line/ character plus V dim, blink, inverse-video and underline, which can be programmed in any combination. It also has a secure feature should it be necessary to enter unseen data such as "Pass-Word" switchable baud rates (50–9600) block/ character made and full duplex options are provided as standard.

By using the function memory, forms can be designed and stored, then dumped to disc for future retrieval via the 2120 Teledisk.

The unit price is expected to be approximately $1995. Currently delivery is 90 days from order, but A.D.E. expect to have stock of these terminals by August.

Further details from Anderson Digital Equipment Pty Ltd, PO Box 322, Mount Waverley, 3149 (543 2077) or PO Box 294, Ryde, 2113 (808 1444).

A.D.E.'s new Teleray terminal.

National Power Down

The American chip maker National Semiconductor has been tackling one of the most irritating problems of microcomputers – the fact that they burn up a lot of power.

A six transistor radio can run for days off a small nine-volt battery. A 7000 transistor Motorola 6800 doesn't use proportionally more, but a system using it plus a manageable amount of memory, plus a useful amount of amplifying circuitry (to make sure that the words it wants to print will reach the printer) will kill that battery in an hour.

National Semiconductor reckons that the people who have tackled this problem in the past have got it all wrong; instead it has produced the new NSC 800 micro. Not just a new computer, but a brand new chip.

What makes the NSC 800 important is that it's not in fact a brand new chip at all. It's a copy of Intel's 8085, plus a copy of Zilog's Z80-two of the most commonly used chips in the micro business. It will run any software written for those micros, without change. But it uses 4% of the power.

In the past, the only way to get a computer to be this

APC's first column of 'micro-happenings' — Newsprint

delay. That's 2000 1980 dollars, don't forget, which according to my calculations is about 4200 1990 dollars — for a dumbo terminal!

Also in the news, a company called Microbyte announced some software for the 2650 (by golly, I'd quite forgotten the 2650 chip, and to think I'd almost bought one). Included in its product range was an Audio Cassette Operating System (!), Dissassembler and Basic.

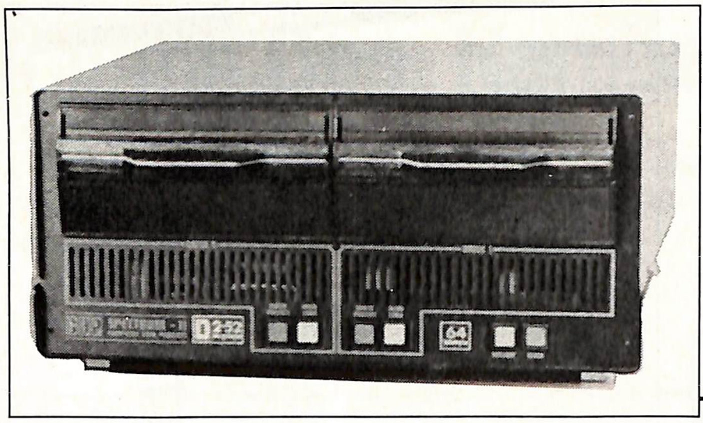
David Webster was in the news with his Spectrum. Now Clive's more recent offspring, the Webster Spectrum was based on a DEC LSI-11 processor and ran standard DEC operating systems like RT-11. It had 64K and two floppy disks — yes, two of them! This was a real serious business machine. An unnamed, but very close to home monthly computer magazine whose name begins with 'A' used one of these beasts for its subscription system up until relatively recent times.

But in 1980, Webster was still to make its place in the DP hall of fame. I refer, of course, to the piglet incident. Some poor hapless farmer bought a Spectrum to help run his fleet of porkers. The Webster organisation saw an angle, and the farmer was besieged by photographers. Who can forget the picture of the Spectrum with a little snouted curly tail sitting on it. Probably no-one, because the shot made it into virtually every publication in Australia. But that was a year or two in the future. In 1980, Webster achieved its first US hardware sale — it had started bringing home the bacon, but would be a while before it was high on the hog.

Advertising space

The advertisements from a decade ago also tell a story. PETs were sold with 8K of RAM and it wasn't a joke. S-100 cards were everywhere. Hey, get yourself a backplane, start buying S-100 CPU cards, RAM cards, tape cards, video cards and wow — you've got yourself a computer. Don't worry that it's

MAY 1980



D.D. Webster's spectrum IID was an Australian-designed and built minicomputer

probably unique in the entire universe and the chances of anyone else assembling the same combination of components makes growing DNA in the bottom of your fridge look good — it's a computer and this is fun!

Ratty 9-pin dot matrix printers cost $1000, a 16K Sorcerer cost $1400, a floppy disk drive cost $380, plus extra for the cable and power supply.

There were names big at the time that have sadly been consumed in the mists of time: Anderson Digital Equipment, Edible Electronics, The Logic Shop, Looky Video and DeForest Software. Likewise, the occasional name that proved to be a future emporium just passing through its embryonic stage: BS Microcomp, for example.

Light Pens cost $20. Mice didn't exist. Every TRS-80 programmer was writing Basic program RENUMber utilities, and EDTASMs (editor/assemblers) were where it was at. General Ledger systems sold for $99. A major selling feature of one G/L was its availability 'on diskette' — quite a bonus, and so much easier than those pesky tapes.

Other essential commodities included cassette cabinets (36 tape capacity for $27.75); a 16K RAM upgrade kit *250ns* (all this for just $85); the acclaimed TRS-80 lowercase character hardware patch ($49.95); the irrepressible 'BioCurve' program ($12.50); and an essential accessory for every S-100 user — an EPROM programming card (kit $205, assembled $255).

Many of the complete systems were quite good value. A 16K Level II TRS-80 cost just $879; the Apple II was pricey at $1395 and was dogged by a lack of a single standard for video I/O; and the Commodore PET could be had for $999 — a fine machine, and forefather of Commodore's policy of shucking all existing standards without quite making one of its own. The Exidy Sorcerer was, to my mind, the machine of choice at the time. It was superb, but it was also $1295 for the 8K model.

At the higher end of the market, S-100 was top-shelf madness. Cromenco actually sold (not just tried to sell) minimally functional systems for thousands upon thousands of dollars. The Hewlett-Packard HP-85 cost $3550, but was a pleasing and capable machine. Microprocessor Applications Pty Ltd advertised a 'Price Breakthrough: The amazing new dual processor with an 8085 and Z80. 630K of disk and 32K of RAM. The complete S-100 computer for $4950 plus tax'.

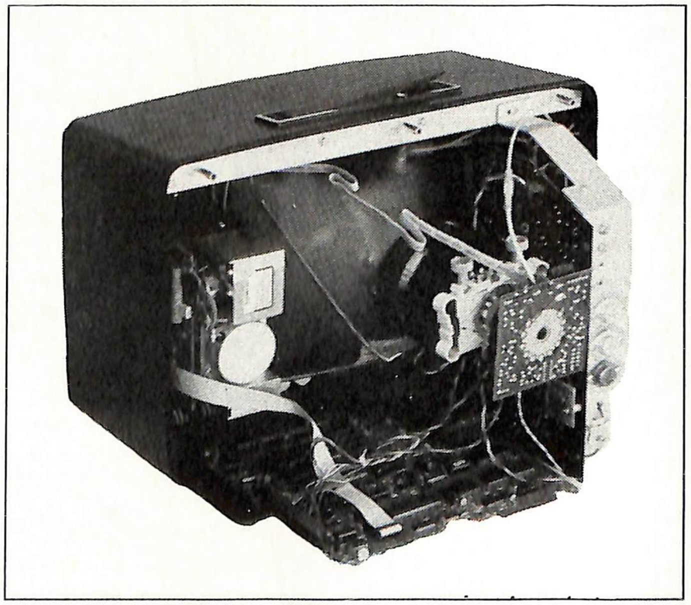
Down at the single board level, things were appreciably more affordable. Single board computers were raw circuit boards with a keyboard mounted on one end. You connect up a power supply, provide your own audio cassette, plug into the TV, and off you go. The Superboard, probably the leader in this field, cost just $360 with 4K of RAM.

The publication

In 1980, *APC* wasn't published by Computer Publications. There have been a few name changes along the way, but the key player has remained the same. At Volume 1, Number 1, *APC* was 56 pages and cost $2.20. It is now 250 to 300 pages and costs $4.95. In 1980, 12 of those pages were advertisements (21 per cent). In the April 1990 issue, 147 of its 258 pages were ads, or 57 per cent.

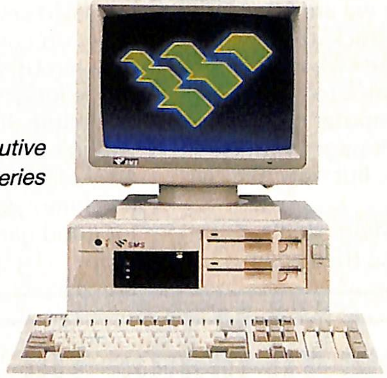
APC ran its first benchtest in that issue — the Compucolor II. This unfortunate machine featured a 2MHz 8080A, 8K of RAM, 128 by 128 pixel eight colour graphics, and a 51K disk drive with a 400ms access time and 76,800 bits per second (bps) transfer rate. All this for $2095 plus sales tax.

So much for the Compucolor II. What is more interesting, however, is the benchtest format itself. Everything was geared for Basic. The benchmarks were all run in interpretive Basic, and generally keyed afresh into each machine for lack of *any* sort of interchange specification. Most benchtest reports included a table of the Basic statements, functions and commands provided by the language ROM. It was really important.



The original caption to this little beauty read, 'The processor board plays neighbours with the CRT . . . we detect no overheating

SUN MOON STAR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In many ways, the benchtests were more interesting a decade ago, as most of the machines were actually different from each other. They reflected different design philosophies at the most fundamental level. Compare that with most of today's benchtests, which are 8088/8086/80286/80386-based IBM architecture computers with 512/640/1024K of memory, one 360K/1.2M disk drive, no 10M/20M/ 40M/70M hard disk with a Herc/CGA/MDA/EGA/VGA display adaptor. How boring.

Also in the May issue, a long haired, bearded, moustached, skivvy-clad Sheridan Williams ran *APC*'s first question and answer column. One of the questions was a real corker: 'Please Mr Williams, what does bank selectable mean?'. Sheridan carefully explained how most micros are limited to 64K, and bank switching is a means through which bits of memory can be remapped externally to the address space to get around this limit. Here we are 10 years down the track, the 64K limit has become 1M, we still use the same trick to get around it, and computer magazines still fill their pages with explanations. But now, we call it EMS.

Some things don't change. But then again, maybe they do. Other questions include: what's a vector; how do I plot lissajous figures; and what's an operating system?

David Levy started his series on computer games, which must have been one of the longest-running series of all time. Its final downfall was in our starting to do useful business things with our machines, causing demand for good game algorithms to drop.

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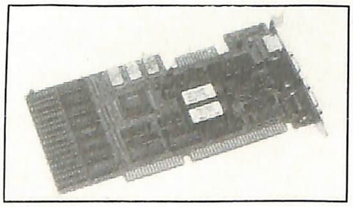

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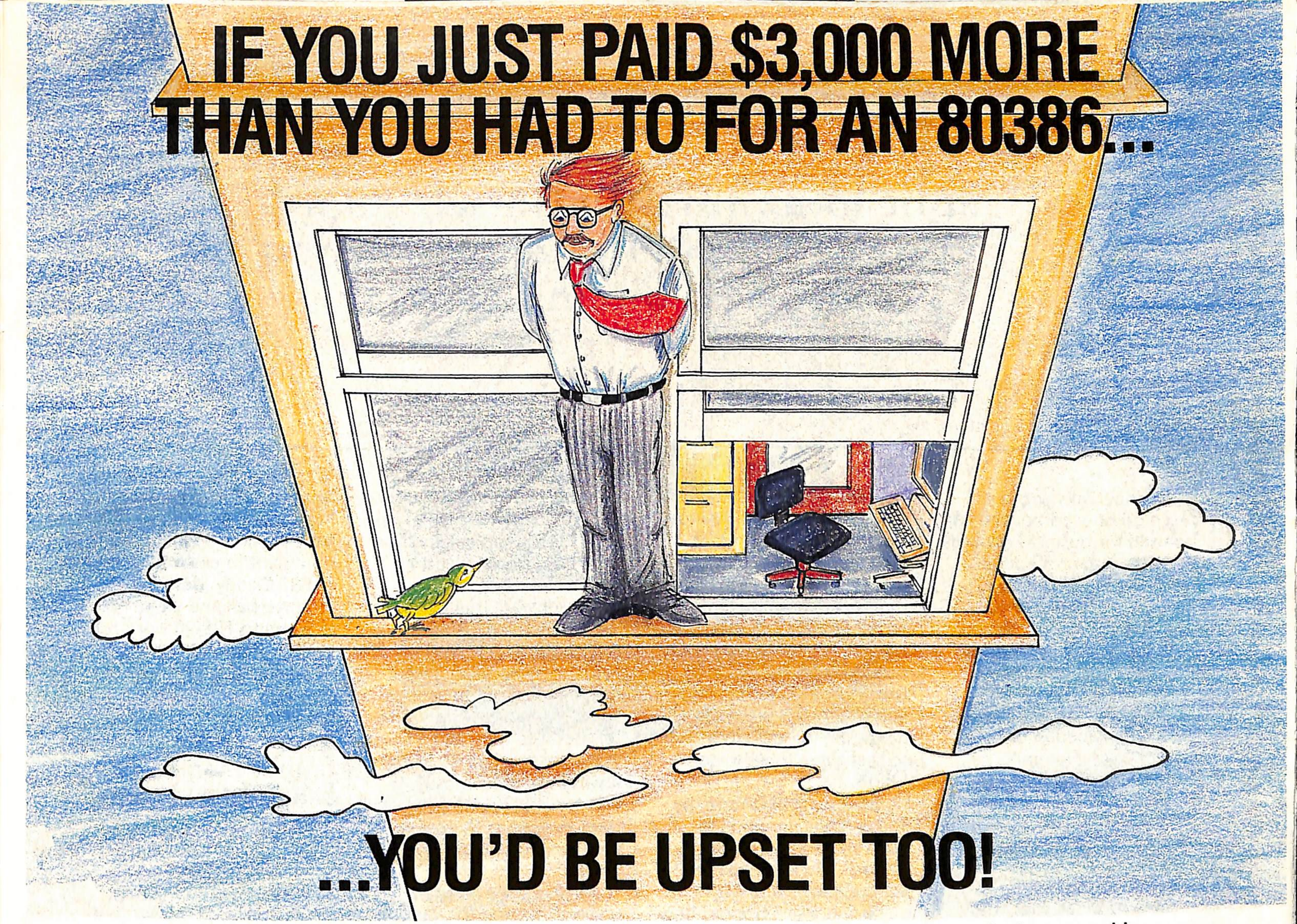

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TOTAL PERIPHERALS

Rodnay Zaks wrote a piece on how computers can be used for business applications (see, the rot had already set in). He covered esoteric topics like word processing, 'menus', accounts payable, sales entry and other interesting theories.

Brian Darling wrote a nice gentle explanation of computer basics. Naturally, he got into machine code programming in the fifth paragraph and binary in the tenth. Is it any wonder that some people found it all a tad formidable!

Two more articles were on language issues. One extolled the virtues of Pascal versus Fortran, Cobol, PL/2, Basic, Algol 60 and Algol 68. The other traced the evolution of programming languages from binary to Pascal.

There followed six pages of program listings. People used to love keying in programs from the back of magazines and spending hours tracking down the typos. It really was a great way to learn, and I suspect the industry came of age when these listings started to disappear a few years later.

Possibly *APC*'s greatest victory of the time is proclaimed on its front page every month. Its name. The 'A' part was easy. The 'PC' part is more interesting. In 1980, the term PC did not exist. These things were 'micros' or 'microcomputers' if one was feeling particularly generous, or just 'computer' for the more pretentious. At the time, *Australian Personal Computer* seemed a strange name. What's a Personal Computer? The meaning was clear enough — we just didn't call them that. It was a little akin to 'intimate machines' (actually, *AIM* . . . that's not bad). The first issue even had to have the line 'Australia's first micro magazine' on the cover, just so that there'd be no confusion.

Of course, as history has it, the name panned out quite well thanks to IBM. For the late 80s *'APC'* was the perfect name for a PC magazine, but I wonder how many of today's readers appreciate just how incongruous it was in 1980.

The big picture

The big issues remain hidden between the lines. Today we are concerned with OS/2 vs DOS vs Unix vs Windows. Eight years ago it was DOS vs CP/M. Ten years ago, the issue simply did not exist. The whole idea of an industry standard software environment (let alone hardware environment) was beyond contemplation. Sure, CP/M was around — but it was for that lunatic fringe with a disk drive. Instead of standards, we had vendor-specific conventions. Programmers could happily bypass recommended interfaces and access hardware directly with total impunity, as their programs were written to run on a Brand X, Model Y computer.

The microcomputer universe of 1980 was Tandy TRS-80, Commodore PET, S-100, CP/M, Apple II and Sorcerer, and from there it all heads down hill. People wrote software that called the TRS-80 (pronounced 'Trash 80') ROM routines directly — not through vectors, but at absolute addresses! We could get away with this because the TRS-80 ROM was the TRS-80 ROM. It was invariable, mostly. It was a manufacturing constant as fixed as the colour of the case. Portability? To what?

In effect, the industry revolved around the various vendors in a clutch of fanatical sub-cultures. Much like DEC supermini users even today. This was both good and bad. Good, because innovation requires a safe harbour from which to depart. Bad, because it fragmented the industry. Today's innovator really has a simple choice of technology platform: IBM, IBM, IBM or Mac. The 1980 innovator had no such clear cut decision. The leader even varied from country to country — there was no right answer, and making the wrong choice was a recipe for tragedy.

It is interesting to note where we were in 1980, and where we are in 1990. Interesting, because there is no direct line of ascendancy between then and now. Today, the world revolves around MS-DOS, IBM clones and Macintoshes. Yet in 1980, the Mac didn't exist, IBM didn't make computers, and MS-DOS didn't exist.

So how did we get here from there? Furthermore, how could anyone in 1980 have predicted what the dominant forces would be in 1990? Clearly, destiny served us curve ball and we're not all running TRS-90's or Apple IIIs. So what makes the pundits think they have any better chance of making predictions for the next decade? Hmmm?

Extrapolation

This seems the appropriate time to pontificate on where we'll be 10 years from now. Using nothing more than a calculator and straight line extrapolation, we can compute the features of the common machine of the day. RAM will have gone from 8K to 640K and on to 51M. Disks will have progressed from none to 20M to 1.6G. Graphics resolution will have gone from 16,384 pixels (128 by 128), through 256,000 pixels (640 by 400), on to 4,096,000 pixels (2048 by 2048). Price will have shifted from $1000 to $2000 and on to $4000. Adjusted back to eliminate inflation effects, it's probably all much the same.

Also applying straight line extrapolation, all of today's burning issues will end up being totally irrelevant, and the dominant architecture of the day will be something that isn't even on the horizon, introduced by someone who isn't presently involved in computers.

Well, maybe.

END

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80286	6/16	1MB	40MB-28ms	1.2MB	1/1/1	$2,149	$2,249	$2,899	$3,099
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386SX	6/16	1MB	40MB-28ms	1.2MB	1/1/1	$2,549	$2,599	$3,199	$3.449
80386	8/25	2MB		1.2MB	1/1/1	$3,150	$3,250	$3,900	$4.100
80386	8/25	2MB	71MB-25ms	1.2MB	1/1/1	$4,050	$4,150	$4,800	$5,000
80386	8/33C	2MB		1.2MB	1/1/1	$4,650	$4,750	$5,400	$5,600
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Most significant microcomputing events

There have been many, many events that have contributed to the formation of the PC industry as it is today. Ian Robinson reflects on the last decade and notes the 10 most noteworthy events.

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Sinclair makes it, APC tests it

A quick scan through the past decade's collection of APC magazines will reveal that every month has contained numerous significant events for the world's microcomputing community, so selecting the most important 10 has proved an onerous task. However, while these different issues may vary in significance — depending on what your own microcomputing requirements are — the following list sums up the events which are perceived to have had the most influence on APC readers in general.

1980 Early minimalist efforts: Sinclair ZX80 and ZX81

Digital watch and pocket calculator pioneer Clive Sinclair (who was later knighted for his efforts) got in on the microcomputing act very early, producing his landmark ZX80 and ZX81 products.

Tens of thousands of technology freaks experienced their first introduction to the wonders of microcomputing via the diminutive ZX80, which boasted an 8-bit clone Z80 processor and a monstrous 1K of user memory to roam around in (which was shared with the variable stack and screen display RAM). Embedded in its 4K ROM was a Basic language interpreter, and *APC's* reviewer summed up the system by claiming: "considering the size and price [under $300 at the time], I think it's not at all bad."

A year later, Sir Clive took this minimalist approach to its extreme, with the release of the $199 ZX81, comprising the same 1K of memory and an 8K ROM. The most amazing thing about this wedge-shaped wonder was that its circuitry comprised just four chips — the RAM, the ROM, the Z80A processor and one other custom ASIC designed by Ferranti.

The *APC* reviewer's verdict: "people can now not only find out if they like programming, but also enjoy their ZX computer and make it do useful and interesting things." Just what type of 'useful and interesting things' it was capable of were not described.

1981 IBM enters the microcomputing arena

"IBM has come up with a real stunner of a personal computer and, much to *APC's* delight, has named it the IBM Personal Computer, which must surely remove any lingering doubts about this magazine's title."

So read the introduction to what was claimed as the world's first benchtest (in 1981) of the now-ubiquitous IBM PC. The system's mighty 16K of RAM and 40K ROM put systems such as the ZX80 to shame, although the price tag was appropriately larger. As with most systems of the day, the original IBM PC came fitted with only a cassette port for data storage — 160K floppy disk drives cost extra, as did video adaptor boards, screens and serial ports.

Then, of course, IBM shook up the marketplace by offering a choice of operating system, including CP/M, the UCSD p-System and a newfangled offering known simply as 'DOS'. With the benefit of hindsight, it would be cruel indeed to reprint the *APC* reviewer's impression of DOS, or his ruminations as to whether the IBM PC would ever make it to Australia.

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1981 A generation in processor technology

In a comparison of forthcoming 16-bit systems in the April 1982 issue, *APC's* reviewer described to the world the exciting new 286 processor from Intel, claiming that "users can now look forward to the day when computers run two or three operating systems — such as CP/M, Unix, Pick and Pascal — simultaneously, without any confusion."

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IBM/Microsoft programming team that later struggled with the 'DOS compatibility box' portion of OS/2 for two years!

Of course, the 286 processor now powers the vast majority of business PCs sold each year, but ironically, very few of today's 286 system users are making use of the chip's 'special characteristics' as first detailed in *APC*.

1983

Commodore 64 arrives on the scene

Perhaps the ultimate winner in the microcomputing longevity stakes is the Commodore 64, which was first reviewed in the May 1983 issue of *APC*, and is still going strong. Furthermore, when you consider its predecessor, the Commodore VIC-20, it can be argued that this system has as long and interesting a pedigree as either the Apple II or IBM PC families.

"It is a good machine," summarised *APC's* reviewer, "with all the facilities that a home user would require, although I have my doubts as to its usability as a business system." Countless thousands of C-64 home users throughout the world would back up his judgement.

1983

First Australian Personal Computer Show

The very first Australian exhibition concentrating exclusively on the personal computing market was held in Sydney's Centrepoint building between March 10 and 12, 1983. Needless to say, *APC* was very much behind the show, and featured it as the cover story of the February 1983 issue.

Conducted simultaneously with the exhibition was the First Australian Personal Computer Congress, held at Sydney's Sheraton Wentworth Hotel, and featuring such notable speakers as Philip Estridge (the 'father of the IBM PC'), Barry Jones, Seymour Rubinstein, Scott Oki and Chuck Peddle.

1984

Apple Macintosh — the Lisa done right?

"Probably the biggest surprise is that the Macintosh is totally incompatible with the IBM PC," stated a bewildered *APC* reviewer in the March 1984 issue. He also reminds us that the Macintosh is described as being part of the ill-fated Lisa family — an aspect that Apple would no doubt rather forget. (At least he was not cruel enough to mention the Apple III).

As for the lack of IBM PC compatibility, the world's millions of Mac users will no doubt defend this 'oversight' to the death, pointing to the Mac's success in popularising the now-ubiquitous graphical user interface.

1986

Debut of the first 386 system by Compaq

The November 1986 issue of *APC* contained what was to be the first of many reviews of systems based on the powerful 32-bit Intel 386 processor.

In a move which firmly cemented its role as a leading-edge, Compaq boldly led the PC field with the release of its Deskpro 386. Formerly known as a developer of portable PC compatibles, the launch of the Deskpro 386 signified the start of Compaq's ascendancy to become a standard-setter at the top end of the PC market.

Intel's 386 processor, which had been around for a year or so prior to the Deskpro 386's release, had excited hardware developers and programmers alike, and its capabilities inspired an ambitious Bill Gates to refer to the 286 as 'brain dead'. However, it was to be many years before either systems software or applications arrived that adequately exploited the power of the 386.

1987

Launch of the IBM PS/2 range and OS/2

The shock announcement by IBM on April 1, 1987 was no April Fool's Day joke, and the PC industry has been reeling from the repercussions ever since. On that day, IBM unveiled its new-generation PS/2 range

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of computers, and simultaneously scrapped the entire PC and AT family. At the same time, the inscrutable giant also revealed plans for an entirely new PC operating system, known as OS/2.

Adhering strongly to its tried-and-true tactics of 'fear, uncertainty and doubt', this move by IBM raised many questions among users, analysts and competitors. Why did IBM dump the AT, when it was selling in record numbers at the time? Why was the new Micro Channel architecture totally incompatible with IBM's previous bus? Why was the PS/2 mouse sold as an extra and not bundled as a standard item? What significance did those strange Model numbers have? And what in the hell happened to OS/1?

1987

Formation of the EISA consortium

In a delayed response to the success of IBM's Micro Channel architecture (MCA), a group of PC compatible manufacturers nicknamed the 'Gang of Nine' came up with an alternative that retained backward compatibility with the old AT-style architecture.

This new technology, which was based around a novel 32-bit expansion slot, was referred to as EISA, for Enhanced Industry Standard Architecture. Unfortunately, it took well over a year from the announcement of EISA in 1987 until the first working prototypes were displayed.

In a rare example of would-be competitors co-operating closely, the EISA proponents, which included Compaq, Hewlett-Packard, AST Research and Olivetti, embarked upon a major promotional campaign to push the benefits of EISA technology.

At this stage, with only a handful of EISA-based systems shipping in quantity, it has been hard to pick a winner in the so-called 'Bus Wars'. However, with many millions of MCA systems sold, and numerous legitimate MCA-based compatibles, IBM remains in a position of strength.

1990

The industry's mega-mergers

The proposed merger of spreadsheet market leader Lotus and dominant local area networking supplier Novell has caused more excitement and discussion within the PC industry than any other corporate issue.

The resulting mega-developer poses a serious challenge to Microsoft, which has always fancied itself as a big wheel in both the spreadsheet and networking markets, as well as in systems software.

At the same time, the merger relegates one-time networking challenger 3Com to the lesser role of tackling the niche markets that remain.

The full implications of the creation of the Lotus/Novell colossus remain to be seen, as the merger was only announced last month, but more coverage of the event can be found in this month's Newsprint (see page 8).

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Best Aussie innovations

Australia has contributed more to the world than Kylie and Collingwood, says Kester Cranswick. We may not have an Australian equivalent to Clive Sinclair or Bill Gates, but there has been no shortage of Australian innovation in the last 10 years.

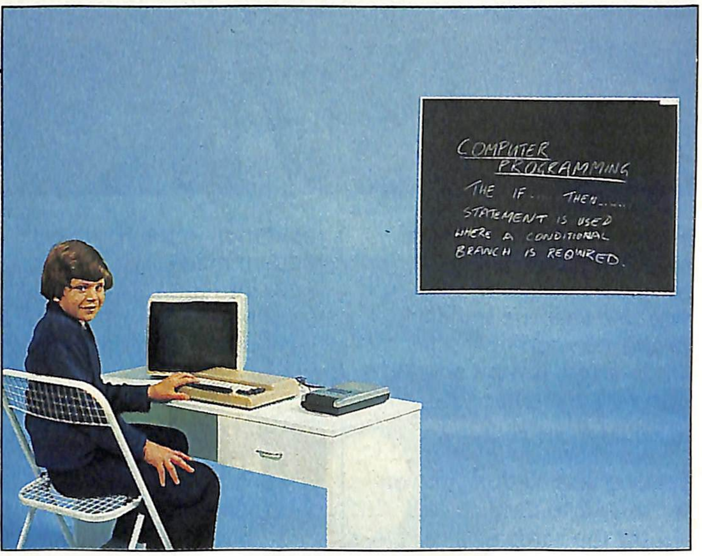
The heyday was probably when APC first appeared. At that time, the PC industry was in its infancy. Hobbyists dominated the market and there was a whole world to invent. Standards were few and far between, everyone had a new product on the go and most of the overseas gadgetry was hard to obtain.

Examples from the time included the Dyad Dragon, an Australian-developed card reader sitting inside the computer; the Aussie Big Board, a single board kit computer; and dBASE Multi, a multi-user database for CP/M platforms. Multi-user systems were a specialty.

Many of these products nearly made it on the international scene. No doubt if CP/M had lasted a few years more, we would have a larger local industry. But MS-DOS pulled the rug out from under the Australian developers and many did not have the resources to move with the times.

In compiling this list of Australian innovations, the hardest decision has been what to leave out. We must disregard the first port of Unix (done in Australia); the many excellent mainframe applications developed; the high-end communications technologies such as that of QPSX; and Telecom's pioneering ISDN work.

Instead, we have chosen a representative selection of products spanning the last 10 years and all areas of the PC industry. For every one of these 10 products, there are three that have been left out. But the chosen 10 illustrate the ups and downs of Australian innovation and remind us of how tough it is to win in world markets. They are also 10 reasons to be proud of our not-so-small contribution to the last 10 years of personal computing.



An early publicity photo of Microbee's first computer. The young man featured in the picture, Mr John Ison, is Microbee's present corporate sales consultant

1982 Microbee, Microbee Computers

It is early 1982. The home computer revolution is in full flight, fuelled by the Apple II and imported, often expensive, kit computers, and the best running CP/M as an operating system. Enter the mighty Microbee, Australia's answer to the Sinclair ZX-80 and one of the very few totally Australian computers. The technology was not entirely original, but the price made it a breakthrough for the local market.

The original Microbee was a $399 kit computer, simple enough for an average person to assemble. It had a Zilog Z80 CPU, 16K of RAM, modest graphics facilities, a monochrome display and could run CP/M. Applications could be loaded from cassette or run from an EPROM. The sub-$400 price made it around a third of the cost of opposition kit computers and it sold like hotcakes.

A fully assembled version was launched a few months later, a colour Microbee in 1983 and a networkable model soon after that.

Hobbyists weren't the only purchasers. The Microbee soon found its way onto educational shopping lists and became a common sight in schools. With the increasing user base, a Microbee software industry was spawned. Many Australian programmers cut their teeth writing code for the Microbee.

The early success carried the company through until the late 1980s, when ambitious plans to develop a computer to link the original Microbee user base with the MS-DOS world fell apart. The company was rescued by the De Simone brothers who halted its slide and introduced a new model, the 640TC Plus, which brought the Microbee into the MS-DOS arena.

The 640TC Plus is innovative in using Australia's first locally designed and produced PC support chipset.

As for the original Microbee, a sample is proudly exhibited in Sydney's Powerhouse museum, a testimony to past glories.

1982 Communications Protocol Card, NetComm

NetComm is the quintessential Australian high-tech success story. From humble beginnings back in 1982, it has grown to a $20 million enterprise, built on the back of the modem. However, it was NetComm's first product, the Communications Protocol Card, that gave the company its start.

NetComm, or DataNetComm as it was then, started life selling Apples to businesses. Staff saw a need to connect Apple II and III PCs to mainframes and set about

The Pocket Rocket 1234 was the first pocket modem ever developed

engineering such a device. NetComm took a prototype to Apple in the US, where it was told that the solution it proposed wasn't possible. Undeterred, it went ahead and demonstrated its prototype working.

Apple was suitably impressed and NetComm won a contract to develop and supply the cards. The card plugged into an expansion slot and supported protocols such as videotex, 3270 BSC, 3270 SNA, 2780/3780 file transfer and asynchronous terminal.

An on-board processor and RAM reduced overhead on the Apple CPU and the card could send data at speeds of up to 19.2Kbps. It was a package that put NetComm on the map. Unfortunately, Apple pulled the Apple III out of the business market, so NetComm's card was not needed. The company then turned to the local modem market, releasing its first PC modem in 1984.

Since then it has continued innovating and now sells over half the modems in Australia. Apple has continued to support the company, giving NetComm a contract to manufacture Apple modems. NetComm has also won business from NTT in Japan.

On the innovation side, NetComm was the first company to develop a four-speed pocket modem, the Pocket Rocket 1234. It is forging a reputation in the high-end modem market, is making inroads into the PC facsimile market and has high hopes of winning sales in the ISDN sector.

1983 Today, BBJ Computers

One of Australia's best recognised software companies was BBJ Computers. Sadly no more, it built its reputation on a leading-edge fourth-generation programming tool called Today.

Today was first released in 1983, running on a Hewlett-Packard minicomputer platform. It was ported to MS-DOS in 1986 and also runs under Unix, Xenix, MPE, VMS, Primos, AIX and across Novell networks.

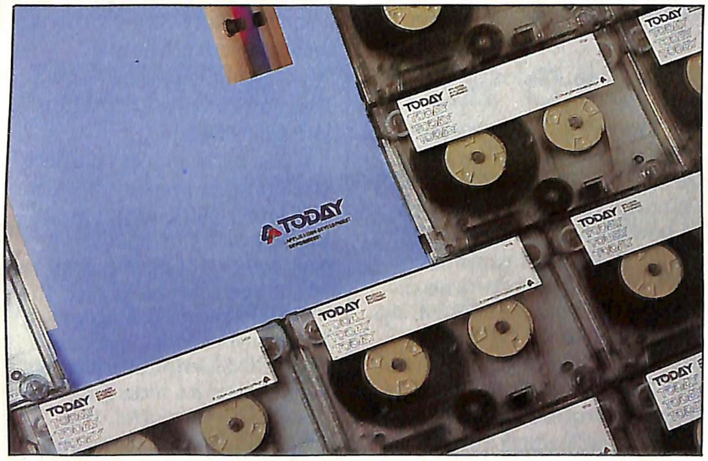
The beauty of Today was that it was database independent. Whereas most fourth-generation languages of the time were written around particular proprietary databases, Today ran on a range of platforms and the same application could draw on data from a range of databases. Products such as Oracle, Ingres RdB and a host of other databases are supported.

Thanks to another innovative feature — support of foreign languages — international success was not long in coming, with Today proving particularly popular in Europe. But BBJ erred in attemping to support too many minor platforms. Overheads escalated and in 1988 the company went to the wall. Today survived. It was acquired by Computer Power Group and has just had a major new release, version 3.0, which continues the innovative tradition.

The major innovation this time around is the incorporation of locally-developed expert system technology to facilitate the building of database applications. For example, Today is able to analyse a mass of data and suggest an appropriate database structure!

In all respects, Today is a powerful, sophisticated 4GL platform. A central dictionary stores system-wide definitions and where they are used, there is context-sensitive help always available, flexible security arrangements and powerful screen generators.

With the strength and international standing of Computer Power Group behind it, Today is likely to remain a major development platform for the foreseeable future — another case of Aussie knowhow being able to hold its own in world markets.



BJ Computers, the company behind the original version of Today is no longer around; however, the product is now distributed by Computer Power Group

1983 Impact L800 Laser Printer, Impact Systems

In the mid 1980s, one of the highest flying companies in the history of Australia's computer industry was Impact Systems. Its wings were an Australian developed controller for a new generation of printer, the laser printer.

Hewlett-Packard had shown the way. Impact, founded in 1983, set out to develop an Aussie answer to the LaserJet.

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The Impact L800 was developed as Australia's answer to the Hewlett-Packard LaserJet

What it came out with was the Australian-built L800 laser printer. The standard eight page per minute (ppm) Canon engine was accompanied by Impact's own controller, which had a Motorola MC68000 processor and offered a range of printer emulations. LaserJet emulation was obvious. What was less obvious, and decidedly good thinking, was Diablo 630, Epson FX100, NEC Spinwriter and Qume daisywheel emulations.

The whole lot was brought together in a command language that enabled special effects. Software written with an appropriate driver could produce brilliant special effects.

The four models of the L800 featured a 16-character LCD status display, from four to 50 built-in fonts, and graphics capabilities. Models were field upgradable too. The icing on the cake was connectivity, not only to PCs, but also to Wang and IBM hosts.

The L800 was an instant success and spurred Impact to continue its innovative course while broadening its market overseas.

Then things ran a little out of control. Over-optimistic sales forecasts and rapid expansion brought cash flow problems. The share price plunged, the company was suspended and eventually acquired by Gestetner.

The technology survived, however. Gestetner Laser's latest laser printers feature PostScript, grey-scale printing and built-in disk drives. They are still in demand and the range is now broader than ever. The Impact name may be no more, but the innovation it introduced was not in vain.

1985

Complete PC Tutorial, Intouch Tutorials

Complete PC Tutorials was first released in 1985. It was a disk-based tutorial covering, as the name suggests, the mysteries of the MS-DOS operating system.

The innovation was in the use of RAM, giving a primitive form of multi-tasking. With the program loaded, users were able to call up the appropriate portion of the tutorial which appeared in a window on top of the screen being used to type in MS-DOS commands. Yes, PCT was one of the first terminate-and-stay-resident (TSR) programs and was definitely well ahead of its time.

Combine that with what was actually a very good tutorial, giving around 25 hours instruction, and Intouch had a winning recipe. Indeed, the product won numerous awards from publications of the time and an Australian Design Award in 1989.

The success of PCT ensured the future of Intouch Tutorials, which is now a part of the Infolink group. The Intouch catalogue covers most popular PC products, with video, audio and computer courses offered.

Intouch has taken PCT considerably further since its first release. The program has been re-written and now has 51 short lessons instead of the dozen or so long original ones. There is a reference mode, a menu-driven interface, error trapping for incorrect commands and two audio tapes are supplied. Intouch has also developed separate PCT packages for MS-DOS 3.3 and 4.0.

A measure of the success of this innovative Australian product is that Commodore and Amstrad have both bundled PCT with their PCs. Commodore has an international arrangement with Intouch and PCT is being translated into other languages.

Australia has had other successes in the computer-based training field, including Rank Xerox' adoption of Webster and Associates' Ventura tutorial, but the Intouch effort first proved there was money in Australian training products.

PC Tutorial has gone from success to success since its release in 1985

1987

Qikdraw, Qikdraw Systems

Sometimes innovation is simply a matter of building a better mousetrap. In the fiercely competitive world of CAD systems, that is exactly what Adelaide's Peter Chan has done.

He is the mastermind behind QikDraw, Australia's hottest PC CAD package. Launched in 1987, it turned heads with its, at the time, radical user interface. The screen was divided into five areas, two showing menus, one showing drawing statis-

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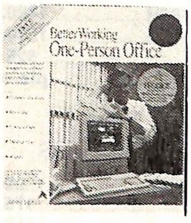

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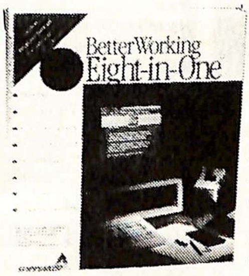

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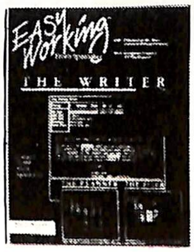

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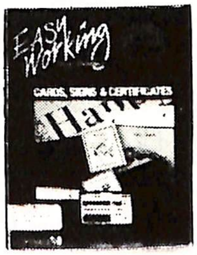

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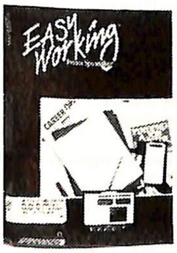

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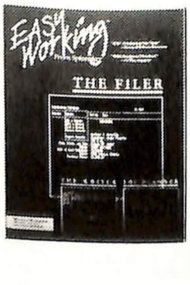

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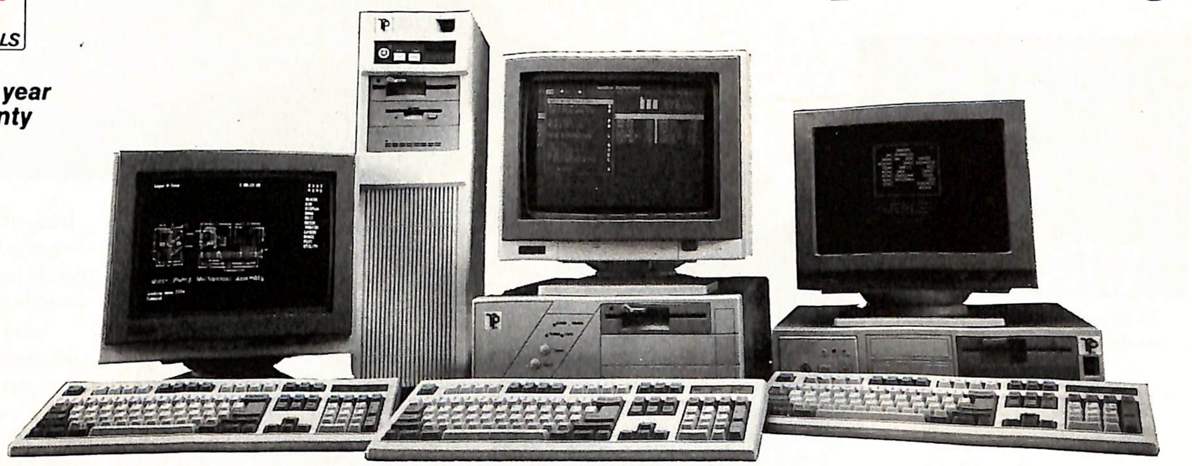

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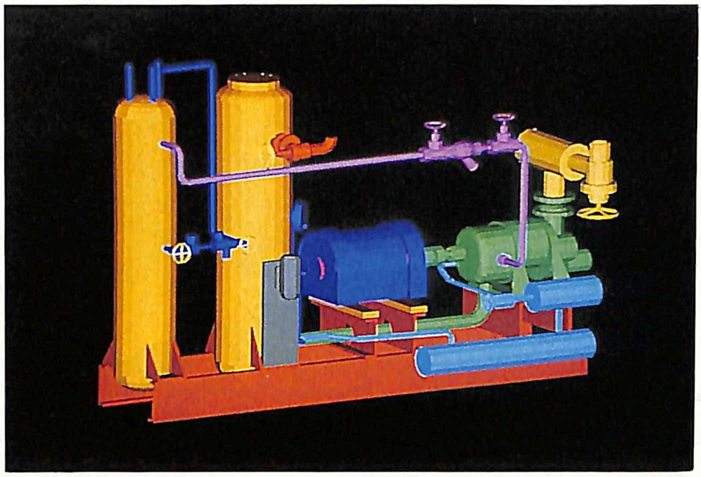


Qikdraw is now adapted to applications geared to the building, steel and computer-aided manufacturing industries

tics, another for command line input and a fifth viewing area for the actual drawing. The approach makes learning the system very easy and lessens the need for keyboard or mouse input.

Besides the interface, the development team had also looked at other CAD systems and come up with a state-of-the-art 2-D and 3-D drafting system. Features such as the recording of a session, so files can be rebuilt, password protection of files, WYSIWYG display of lines, an extensive macro language and the ability to compose drawings out of sub-drawings add up to a powerful product.

QikDraw picked up an Australian Design award in the year it was launched and an AITA award for computer graphics of the year in 1988. The product range has been extended considerably since then, with the technology adapted to applications geared to the building, steel, fashion and computer-aided manufacturing industries. Symbol libraries, a graphics language and other add-ons are available too.

QikDraw is now an international product, sold in the UK, Hong Kong and even the USSR. The product was developed with adaptation of the menus to foreign languages in mind. With these moves, plus an ever increasing number of vertical market applications, the QikDraw team will have its hands full for many years to come.

1989

Atlantis PC/TV, Atlantis International

Sometimes making one and one equal two is not as easy as it sounds. Melbourne-based Atlantis International found that out when it set out to develop the PC/TV, which combines a 20in remote control television with a 10MHz, 640K, XT-compatible PC.

Atlantis had to develop a circuit board to translate the computer's video signal to a form suitable for display on a television. This involved improving the quality of the TV display. The display from the computer offers CGA resolution, but has EGA's 16 colours.

Atlantis's owner, Paul Sahhar, is someone with the imagination to invent new products and the company to build them. But an innovative idea does not always guarantee a commercial success, and the PC/TV is yet to make an impact in the market.

The Atlantis PC/TV interfaces the common television receiver with an IBM PC or compatible computer

The television side of the $2700 PC/TV is from Panasonic. It has infrared remote control, UHF and VHF tuning and functions just as any TV would. Pressing two buttons on the remote control boots the computer, which takes over the display. A 101-key keyboard is connected by cable to the front of the set.

Inside the cabinet is the computer. The 640K of RAM of the 10MHz XT can be expanded to 1M, and there are five XT expansion slots, a 3.5in floppy drive and a 20M hard disk. Out back there are serial, parallel, games and external RGB ports. The RGB port means the computer and television can run simultaneously, with the computer driving the external display. The large display is excellent with videotex services and great for games and kids' software. It makes an excellent second television set too.

The trouble is, PC/TVs will probably only really take off when the Japanese introduce them. Companies like Atlantis may have got there first, but innovation alone is not enough to bring in customers.

1989

T-40 PC, Terran Computers

When Intel announced the 486 chip to an expectant world last year, it fired the gun in the race to become the first company to market with a 486 PC. Apricot was the first company to announce a product, but Melbourne's Terran Computers was the first to sell a 486 system to Australian users. It beat the HPs and Compaqs of the world by months.

Terran's T-40 was the first 486 available to Australian users

The T-40 was not particularly innovative in its styling, but it boasted the power of a 25MHz 486 CPU in a CAD-orientated desktop unit, and had a price around half that of the major players.

Terran's secret is knowing what to do and being small enough to do it quickly. The company also has excellent ins with Intel, and was able to start initial development of the T-40 months before the 486 chip was announced. When it first heard of the 486 it was developing a 30MHz 386 PC, realised the performance limitations and promptly switched to the new processor. CPU compatibility ensured development remained on course.

The T-40 used industry-standard building blocks, such as VGA-standard graphics and AT-architecture. But the company had to engineer interfaces to AT-style controllers and support chipsets.

Hypertec's Neville Clarke shows off the MC 32/16 board

Memory is standard at 1M, expandable to 16M. There are four expansion slots, two serial ports, one parallel port and disk to suit the needs of the user. Pricing starts at $6500.

Within the T-40 there is a high content of Australian-sourced components. The BIOS is an Australian-authored affair, as is the keyboard controller. That in itself is innovative, given the plethora of imported components that populate most Australian-assembled PCs.

Also unusual is the fact that the development has been done without government handouts. Terran is probably the most patriotic of all Australian computer companies and one that is not afraid to fight for the rights of local manufacturers.

1989 Hyperam MC 32/16, Hypertec

Hypertec is a Sydney-based builder of memory and add-in boards for PCs. In the last four years it has released around 30 products, starting with I/O cards for PCs. Though not a big business (revenues were $5.8 million last financial year), the company has shown a flair for innovation that was most evident in the MC 32/16 memory board for MCA PCs, released last year.

The MC 32/16 is a 32-bit memory board suitable for both 32-bit and 16-bit MCA machines, able to take from 512K to 32M of RAM. With falling memory prices, a 2M version costs $1410. When released the same board cost $2387.

MCA boards are far from common. The problem Hypertec had to tackle was lack of space inside PS/2 computers. Memory boards, especially those able to hold 32M of RAM, need a fair amount of room for the chips and controllers. Hypertec's innovative solution involved designing its own application-specific integrated circuit with 24,000 transistors and 6000 gates. It does the function of 23 separate chips.

The ASIC chip was a complex project. It cost $250,000 to develop, of which the Federal Government contributed some $93,000. Hypertec engineers did the primary development and testing of the ASIC on a PC CAD system in Sydney. The work was completed on Motorola's mainframe at its facility in America. Motorola now manufactures the chip.

Hypertec products have already had significant export success in the UK. This year, the company won a major export award and is expecting export revenues to outstrip local revenues by 1992.

As for the ASIC technology, it is likely to find its way into other memory products, such as AT-bus boards and a version for EISA PCs. As applications continue to demand more memory, Hypertec is well positioned for future growth and committed to further innovation.

1990 Drift, Telecom

For all its size, Telecom Australia has rarely been seen as a centre of innovation. A centre of technical expertise, yes, but innovation is not a long suit. That mould was well and truly broken by Drift, a product developed by Telecom because there was nothing else in the world capable of effectively doing the job they needed.

Drift is a piece of PC software that transparently links several different mainframes. It presents a common user interface to up to nine different sessions, integrating data from several sessions on to one screen and making a single personal computer do the job of numerous dumb terminals.

So good is the product that Memorex Telex fought for the export rights and is hoping to sell 10,000 units around the world.

Drift was originally developed internally by Telecom to save it the expense of re-writing its diverse mainframe applications, running on a variety of proprietary platforms.

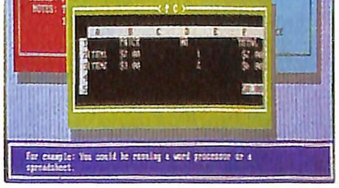
The product is actually a tool kit. Corporate developers can use Drift to develop customised front ends to mainframe systems on their PCs. The toolkit contains a variety of terminal emulators, presentation utilities and a compiler that generates run-time expert systems embodying the users' knowledge.

With these tools, sophisticated front ends to multiple mainframes can be generated. Users are freed from the tedium of learning different procedures for different systems and are given a PC-standard interface — with colour and windows — instead of the often arcane, text-based mainframe screen.

Drift is a solid product too, which is more than can be said of some other Australian innovations. It has been used internally by Telecom for the last two and a half years, on 1000 PCs and handling 250,000 transactions per day for 50 applications.

That's the sort of beta testing few software companies can match, and it assures Drift of a bright future.

END



Record Number: 7
CUST ID: 7654321000
NAME: John Smith
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Record Number: 6
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For example: You could be running a word processor or a spreadsheet.

Telecom's Drift serves as a front end to online sessions

Best products

Nominating the best of the best, what a task. In narrowing the selection to just 10 products, Phil Cohen chose not only those that are mind-blowing today, but also products that were revolutionary for their time.

Ten years is a long time in any industry, but in the PC industry 10 years is the whole of history. Some of the products I've chosen may not seem very impressive now, but that's because they have been overtaken by events. In their day they were hot stuff.

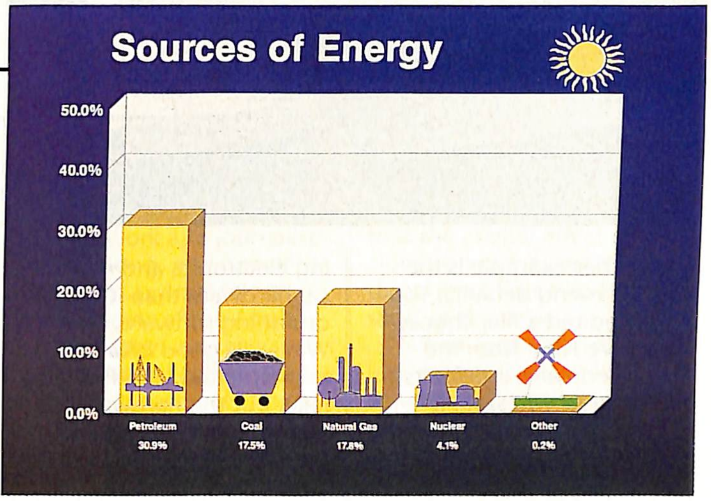
Of course, all of this raises the question: of the products that are 'hot stuff' now, what will be around in the year 2000? The only products that seem to stick around for decades are software products. And then only those software products in which there is an investment. If it weren't for the fact that a lot of engineering and scientific number-crunching routines had been written in Fortran, it would have died a few years ago.

That's one sort of investment; another is an investment in training. A lot of people have spent a lot of time tinkering with Unix, which is one of the things that's keeping the beast alive.

So what software will be around in 10 years from now? Operating systems and languages are the longest-lived, because they are the stuff of other software. And which operating systems and languages will be the ones most likely to survive? The ones which are most difficult to learn.

OS/2 is the name on everyone's lips. Although it's (fairly) easy to use, development for it is very difficult to learn. So it will be around for a while. My other guess is that dBASE will still be here in 10 years, because of its huge grass roots software and learning investment.

The PS/2? No other hardware platform has lasted 10 years in this industry: I reckon it will disappear. The Micro Channel bus will go with it. The same goes for the PC and the Mac. So in 10 years we'll be running dBASE applications under OS/2 on unimaginably fast hardware; I think I'll take up basket weaving instead.



Harvard Graphics has become such a popular business graphics package because of its user interface

CP/M

CP/M was developed for a specific application, and it did its job very well. But the most important thing it did was to open up some sort of reliable data and program storage and exchange for amateurs. The 'some sort of' is significant; there are at least 100 different CP/M disk formats around. The basic idea is that if you want to swap disks with another manufacturer's machine . . . you can't. But if you did manage to get the software onto the target machine, it would run.

I go back a long way in the PC industry (back to when it was called the microcomputer industry). The first personal computer I used was a Commodore PET, with a keyboard like a bad day in a chicklet factory and a tape drive — an audio tape drive, the kind you use to record Slim Dusty to annoy your neighbour's dog.

Recording programs (for that was what it was called) involved winding the tape back to the start and simultaneously pressing a keyboard key and the tape recorder button. If you were lucky, you could get away with recording each program only three or four times to make sure that it was actually on the tape. Of course, this was before personal hard disks.

Imagine the feeling of relief to be using a machine with a floppy disk drive, and knowing that there was at least an 87 per cent chance that your program was actually safe the first time you saved it! CP/M had its problems, but it was a good deal better than tapes.

The main problem with CP/M — as with any product that people become deeply involved in — is that it won't die. There are still versions of CP/M running on machines in commercial environments. It has this in common with other anachronisms like Pick, Fortran and Unix, all three of which are over 20 years old.

Harvard Graphics

Harvard Graphics is a package for taking a lot of numbers and turning them into a pretty graph. It's basically for business graphics. Working for a documentation company, it's not often I need business graphics but when I do, I need them to be good. Harvard is also one of those packages that is so good that you end up just playing around, even when you don't actually need to do useful work with it.

Why is it so good? Because of its user interface. Harvard has been designed by someone who knows what users are going to need. A small example: no matter where you are, no matter what you are doing, pressing F2 will draw the current graph for you. So if you're in the depths of the parameters data screen, or in the data itself, you just press F2 to see what the graph looks like; then change a number or two, or a parameter, and press F2 again to see the effect.

The latest in the range of HP LaserJet offers superb print quality, typeface scaling and vector graphics

Another example is the sensible menu defaults. You simply edited a file, choose 'Get/Save Files' from the main menu and it defaults to 'Save'. After you save, it defaults to 'Get'. A small point, but indicative of a philosophy that runs throughout the package.

I said I don't use the package often: for documentation we often want to produce menu 'trees' to go in user manuals. Harvard has an excellent facility for drawing what it thinks are organisation charts (who reports to whom); although the package doesn't know it, that's ideal for menu trees. Each 'person' on the organic chart becomes a menu item.

The only problem we have with Harvard is how to get pictures out of it and into Ventura. We have to resort to producing metafiles (.CGM) from Harvard, which necessitates loading a new CONFIG.SYS file to point to the metafile drivers. But that's just a quibble.

HP LaserJet

I used to work in the electronics industry, and there are some company names from that industry that still invoke a sense of awe. Hewlett-Packard is one of them.

HP's name in the computer industry is not quite so awesome. The company is a good deal better at designing electronics and mechanical hardware than it is at designing software. NewWave is a good idea badly implemented, and PAM is a joke. But the hardware is a different story altogether. The LaserJet has become one of the de facto laser printer standards, alongside PostScript (which, by the way, is useless if you want to print lots of screen dumps.)

Now, I know that the LaserJet — and just about every other laser printer on the market — is based on the Canon 'engine'. Canon has an excellent reputation in the photocopier field which complements HPs. It's no surprise that in my office at Hard Copy I have a Canon photocopier and an HP printer; both are excellent.

The printer control language of the LaserJet provides just enough power to allow the printer to do what you want (except print white on black, I must admit), but not so much that it takes forever to work out what you want, as is the problem with PostScript.

However, the real power of the LaserJet in our environment (which, if you hadn't guessed by now, is documentation) is its reliability. The LaserJet series II next to my desk has been running hot since it was purchased more than two years ago, and it hasn't had a single fault. Even paper jams are almost unheard of.

I might also add that the documentation that comes with the LaserJet is beyond reproach. All in all, the machine is well-designed, well-engineered and well supported.

Javelin

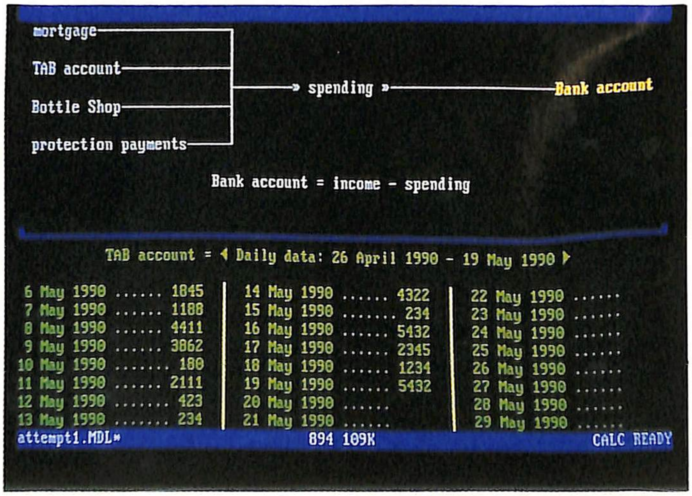
Javelin is the product that should have been. It should have been the natural successor to Lotus and all the other spreadsheets, at least for financial applications. It should have been wildly popular and widely used. Unfortunately, it was none of these.

There is a particular use of spreadsheets for financial calculations that involves setting the rows to represent accounts (sales, expenses, etc) and the columns to represent periods (months, quarters or years). By fiddling with the numbers, and getting your spreadsheet to create graphs, you can produce what is effectively a mathematical model of a company over time.

Unfortunately, using a spreadsheet for that sort of thing is not ideal. Although spreadsheets are intuitive, they are extremely fiddly.

Javelin takes the spreadsheet idea a logical step further. It assigns each account a name, and then allows you to enter numbers for each account for each period. So if you define a variable called 'sales', it allows you to put in guesstimates of sales for each month in the period you want to model.

You then enter equations, such as 'profit = sales – expenses'. The formulae can be quite complex: 'expenses = RAVG (fixed costs,3) + (variable costs * output)' ('expenses equals the three-month rolling average of fixed costs, plus variable costs times output'). Like any other

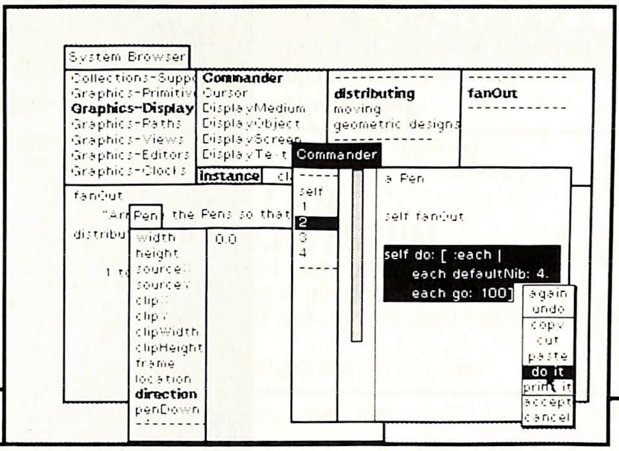


```
mortgage──────────────┐
TAB account───────────┤
                      ├────» spending »──────────────Bank account
Bottle Shop───────────┤
protection payments───┘

                   Bank account = income - spending

          TAB account = ◄ Daily data: 26 April 1990 - 19 May 1990 ►
 6 May 1990 ...... 1845 │ 14 May 1990 ...... 4322 │ 22 May 1990 ......
 7 May 1990 ...... 1188 │ 15 May 1990 ....... 234 │ 23 May 1990 ......
 8 May 1990 ...... 4411 │ 16 May 1990 ...... 5432 │ 24 May 1990 ......
 9 May 1990 ...... 3862 │ 17 May 1990 ...... 2345 │ 25 May 1990 ......
10 May 1990 ....... 180 │ 18 May 1990 ...... 1234 │ 26 May 1990 ......
11 May 1990 ...... 2111 │ 19 May 1990 ...... 5432 │ 27 May 1990 ......
12 May 1990 ....... 423 │ 20 May 1990 ......      │ 28 May 1990 ......
13 May 1990 ....... 234 │ 21 May 1990 ......      │ 29 May 1990 ......
attempt1.MDL»                 894 109K                        CALC READY
```

An example of Javelin's ability to show the relationship between variables



```
self do: [ :each |
     each defaultNib: 4.
     each go: 100]
```

Smalltalk was, and is, an abominable application-development environment, but it must be credited as being a remarkable development in object-oriented programming

spreadsheet, Javelin will automatically recalculate and draw graphs, but it's the user interface of Javelin that really makes it fly. You can get it to produce a diagram for a given variable, showing the variables that affect it, and the variables it in turn affects. You can even scroll through the diagram at will, looking at the whole of your model in graphical form.

Javelin is much easier to use for financial modelling than, say, Lotus, and in some ways much more powerful. But alas, accountants are inherently conservative, and they went right on using Lotus.

Smalltalk

Aha! Got you. Phil Cohen has finally flipped. In the December '89 issue of *APC* he co-wrote an article called 'Dogs of '89', in which he cited Smalltalk as one of the worst products of 1989. Now he's citing it as one of the best products of the past 10 years. He's got a memory allocation error. He's got a corrupted FAT.

Smalltalk for the PC is one of the worst application-development environments I've ever had the misfortune to come across. However, if it weren't for the original Smalltalk, developed by Xerox all those years ago, windows would be what mice looked out of by climbing onto a desktop.

Of course, history (and the US courts, I believe) tells us that Apple designed the Lisa (which was the Mac's forerunner) after looking closely at the Xerox PARC Smalltalk implementation. And we know where Microsoft got all of the ideas for OS/2's user interface . . .

Smalltalk was a truly remarkable development; not only did Xerox invent mice, windows and all that other stuff, it also invented object-oriented programming. Whether that last one was a good move or not depends on your point of view, but it was remarkable nonetheless.

The PC industry started with the emulation of the mainframe/mini. (I remember some years ago seeing a colleague proudly playing with the switches on the front of his personal computer, on which he would set the start address for execution of the program he wanted to run. The only other time I've seen switches like that were on the front of a mini.)

The second step was to improve on that mainframe/mini interface, and that's the stage we've reached now, with OS/2 a marked improvement over the C> prompt.

The final step will be for the PC to drive the user interface in the mainframe industry. We already have clients asking us to produce mainframe documentation that looks 'as good as PC documentation'. OS/2 is IBM's way of letting its customers get information out of their mainframes without going bananas. And Xerox started the whole thing.

Taiwanese clones

I used to work as a journalist in Hong Kong, and one of the stories I produced was on the origins of the Apple clone industry. It appears that a technical college (like a TAFE) in Japan asked its students to copy an Apple as an exercise; the board masters found their way to Taiwan, which is not a signatory to the international copyright convention. After that, it was easy.

Hong Kong was, in those days, completely full of Apple clones. They were cheap, plentiful, and software could be had for (literally) the cost of a blank disk. Shops in the 'Golden Arcade' would sell software as a way of increasing their blank disk sales!

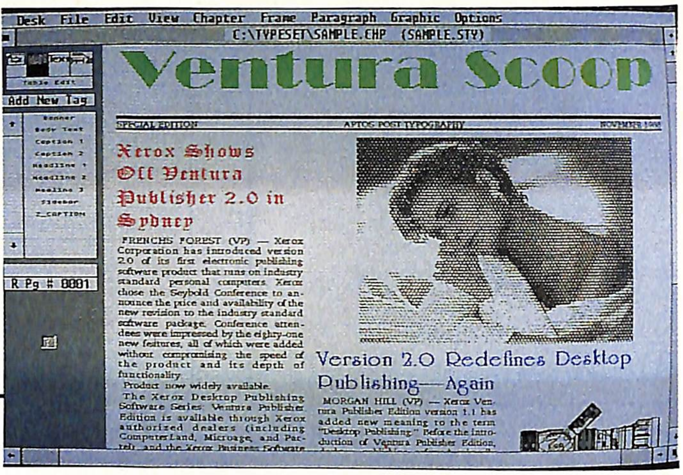
Now, I've written commercial software for publication and had it ripped off, so I have little sympathy with people who sell pirated software, but I have to admit that the overall effect of the clones on computer literacy throughout Asia was nothing short of dramatic.

When Apple started to lose market share to IBM, the Taiwanese (and their distributors from Hong Kong and elsewhere) turned to PC and XT clones. The flood of these into the developed world sparked the revolution in personal computing. Who lost out? Only IBM.

Now, of course, IBM has tied up the MCA bus tighter than a duck's intellectual property, and anyone trying to clone a PS/2 is going to bear the full pinstriped weight of a large US company's legal department. To what extent has IBM actually gained by the increase in market size brought about by Taiwanese PC clones?

The Wyse range of PCs are just one of many Taiwanese clones available in Australia

Ventura is the only DTP package available that will successfully handle large documents



Ventura Scoop

Xerox Shows Off Ventura Publisher 2.0 in Sydney

FRENCHS FOREST (VP) — Xerox Corporation has introduced version 2.0 of its first electronic publishing software product that runs on industry standard personal computers. Xerox chose the Seybold Conference to announce the price and availability of the new revision to the industry standard software package. Conference attendees were impressed by the eighty-one new features, all of which were added without compromising the speed of the product and its depth of functionality.

Product now widely available.

The Xerox Desktop Publishing Software Series: Ventura Publisher Edition is available through Xerox authorized dealers (including ComputerLand, Microage, and Pac-

Version 2.0 Redefines Desktop Publishing—Again

MORGAN HILL (VP) — Xerox Ventura Publisher Edition version 1.1 has added new meaning to the term "Desktop Publishing." Before the introduction of Ventura Publisher Edition,

(This is not a conspiracy theory, just an irony).

The Taiwanese have done wonders for the computer literacy of the whole developed world (even the Evil Empire has a few clones, and they're sure to have a few more in the future). Perhaps we should regard them as the goodies instead of the baddies of the personal computer industry.

Turbo C

A couple of years ago, I had the pleasant experience of showing Turbo C to a mainframe programmer and watching his jaw hit the floor in amazement. The big deal for him was that you could compile from within the editor. Not only that, but if the compiler found a syntax error it would drop you back into the editor at the place where it thought the error was.

I once had a curious job: a client knew that we developed a lot of in-house utilities in C, and asked if I could do a little software development for him. The application was basically syntax analysis, and the target machine was the client's Wang VS. I developed the (not particularly large, but not particularly simple) routine using Turbo C, and then ported it onto the VS and started trying to get it to work.

Not only was compilation a lot slower on the VS than on my PC (and the printer was in the next room), it was all command line driven. I had to keep going in and out of the editor, invoking the compiler, and so on. It took a couple of days to develop the software from scratch on the PC, and another full day or so to get it working on the VS.

There are compiler wars going on now between Microsoft and Borland (the developer of Turbo C). Borland keeps adding new wrinkles to its compiler, and Microsoft also keeps adding new wrinkles: currently the Borland ones are slightly more wrinkly.

The reason I'm citing the Borland Turbo C compiler, rather than the Microsoft one, is that the Microsoft compilers have been around for many many years, and until Borland came on the scene, they all worked like mainframe compilers — command line driven and a pain in the syntax. If it hadn't been for Borland, we'd still all be compiling the way mainframe programmers compile.

Until Borland released its version of Turbo C, all compilers worked like their mainframe cousins

Ventura

Hard Copy is a documentation company, so our desktop publishing package is the single most important piece of software in the office. There are really only two DTP packages of note around for the PC: Ventura and PageMaker.

We recommend PageMaker to some of our clients, but we use Ventura. Why? Because PageMaker is good for some documents, Ventura for others. PageMaker is good if you want to produce brochures, newsletters and manuals up to about eight pages long. After that, it's hopeless.

Most of the documents we handle are in the 100-plus pages range. Where you have 100 pages of manual with perhaps 40 screen dumps, Ventura is the only PC product on the market that will do the job properly.

One of Ventura's biggest drawbacks is reputed to be it's difficulty of operation. That's true, but only because typography is an inherently complex subject. If Ventura was easier to operate, it wouldn't be able to do the job.

For example, we're often asked to produce a manual to an existing 'style standard'. This means copying the layout of a set of older manuals; something Ventura is very good at. Take a look at the necessary typographical complexity involved in setting up just a single level of headings: typeface, type size, justification, spacing above and below, spacing at top of page, underlines and overlines, shade bars . . . the list just goes on and on. And that's for a single level of heading — there may be three or four. For a package to be able to handle all of those, it must be complex. The reason why Ventura is popular is that it is complex, but no more complex than it needs to be.

Ventura also has fewer bugs than most packages of equivalent size. The only major problem from our point of view is the support, which — in Australia at least — is woeful. But there are enough copies of the package out there now to have built up a pool of user expertise sufficient to overcome that problem.

MicroGram COMPUTERS

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- * 48 Digital I/O lines programmable as input or output.
- * 16 channels have LED status display.
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- * Programs 2716, 2732, 2732A, 2764, 2764A, 27128, 27128A, 27256, 27356A, 27512, 27512A.
- * Read EPROMS and save to disk.
- * Read from disk and write to EPROM.
- * Modify EPROM.
- * Blank check.

Single burner	**$190.00**
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ALSO AVAILABLE

* 8748/49/50/41/42 Writer Card	**$650.00**
* Bi-polar PROM Writer Card	**$585.00**
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* Universal Programmer	**$1460.00**

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- * Capacity 2Mb per card, 4 cards per system
- * Will backfill conventional memory to 640kb.
- * Comaptible with EMS and EEMS memory to run with Lotus 1-2-3, DESQview II etc.
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- * Fly back transformers, power supplies and circuit diagrams to suit MD3, MD300, MD7, MD700 and MD11 monitors.

BAR CODE READERS
- * Selectable keyboard interface (connects between keyboard and computer) or serial interface.
- * Bi-directional scanning.
- * Will autodiscriminate most barcode symbologies eg.UPC/EAN/JAN/Code 39/Interleaved 2 of 5.
- * Barcode printing software included. **$450.00**
- * Barcode slot reader with above features. **$615.00**

"EXTERNAL" FLOPPY DRIVE CONTROLLER
- * Allows two addtional floppy disk drives to be fitted (beyond A: and B:)
- * Supports 360/720/1.2/1.44 on both XT and AT computers
- * No need to replace existing hard disk floppy disk controller cards
- * "External" drive(s) may be mounted internally with 34 pin header and ribbon cable or externally via 37 pin D connector. **$135.00**

5m PRINTER CABLE
- * Standard IBM printer cable 5m long **$30.00**

TOPWARE LAN OPERATING SYSTEM
- * Network up to 64 computers.
- * 10Mb/sec Ethernet interface cards.
- * Supports record locking with multi-user software.
- * Supports file locking with single user software.
- * Network software users familiar DOS commands.
- * Shares all file server hard disks.
- * Shares printers anywhere on the network anad allows output redirection with popup utility.
- * Starter kit (Two interface cards, coax cable, connectors, software and manual). **$1100.00**

AT DIAGNOSTIC CARD
- * Plug into motherboard expansion slot and switch on.
- * Error code is shown on LED display indicating failure of one 59 possible tests.
- * Where appropriate the manual indicates the area of circitry and / or the suspect IC associated with the error code. **$150.00**

VOICE CARD
- * Digitally store a human voice on disk.
- * Playback through your own programs.
- * 10 Bit sampling at 16K or 32K bits/sec.
- * Store approx. 1.5 hours on 20Mb Hard Disk
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- * Microphone and speaker included. **$145.00**
- * Addititional stand-alone card to play back 16 messages stored in EPROM **$149.00**

KEYPAD FOR LAPTOPS
- * Provides an external cursor pad for Laptop computers.
- * Plugs into 9 pin RS232C port.
- * Software directs keypresses to keyboard buffer. **$160.00**

ADAPTERS AND TESTERS

* AT keyboard to PS/2 adapters	**$23.00**
* Centronics gender changer F/F	**$12.00**
* Centronics gender changer M/M	**$12.00**
* DB9/DB25 Adapter F/M	**$12.00**
* DB9 gender changer F/F	**$11.00**
* DB9 gender changer M/M	**$11.00**
* High density DB15 F/F	**$14.00**
* High density DB15 M/M	**$14.00**
* High density DB15/DB9 M/F	**$12.00**
* Null Modem DB25 M/F	**$10.00**
* Gender changer DB25 F/F	**$10.00**
* Gender changer DB25 M/M	**$10.00**
* RS232 Loopback tester DB25 M/F	**$20.00**
* RS232 Pin 2/3 reverser DB25 M/F	**$11.00**
* RS232 Surge Protector DB25 M/F	**$20.00**
* RS232 Mini wiring box DB25 M/F	**$25.00**
* RS232 Mini tester DB25 M/F	**$60.00**
* RS232/RS422 Converter DB25 M/F	**$60.00**
* RS232 to Current Loop	**$190.00**
* RS232 to RS422/485	**$190.00**
* Parallel/serial converter	**$105.00**
* Serial/parallel converter	**$105.00**

PS/2 MOUSE
- * A two button mouse compatible with the IBM PS/2 computers.
- * Tracking speed 500 mm/s
- * Resolution 200dpi
- * Includes driver software

$139.00

BUS MOUSE
- * A three button bus mouse compatible with the IBM XT/AT computers and compatibles
- * Bus interface card included
- * Microsoft Mouse and Mouse Systems Mouse Compatible
- * Includes driver software and menu maker software **$120.00**

COMPUTER TERMINAL
- * Compatible with PC Term, ANSI and DEC VT220 terminals.
- * Uses standard PC monochrome monitor, and standard PC keyboard.
- * Provides standard PARALLEL printer port.
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- * Provides Stereophonic sound effects for Sierra and other compatible games **$255.00**

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- * Protect your spftware from unauthorized copying.
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- * Allows a standard parallel printer to be operated at up to 1200m from the host computer
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- * Transfer rate 22.5kb/sec
- * Kit includes transmitter, receiver and 10m cable **$165.00**

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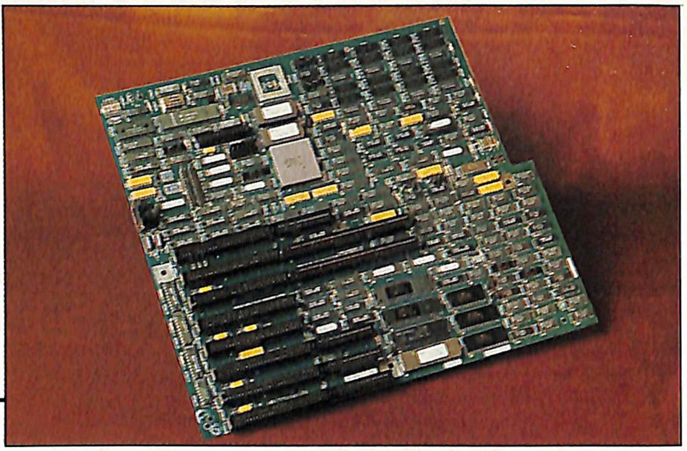


IBM opened its architecture with the XT and AT bus; however, its PS/2 range is based on proprietry technology

WordStar

WordStar? I hear cries of horror from devotees to WordPerfect, Word and other newer packages. WordStar is the most maligned word processing package since EDLIN. But in its day, it was truly revolutionary.

I wrote a book, some years ago now, using an Apple II+ with a Z80 'softcard' that allowed it to run CP/M. The only word processor I had to hand was ED, a line editor which was the precursor of EDLIN. I produced around 30,000 words, delivered it to the publisher (Prentice-Hall) on disk, and it was typeset direct from that disk. In those days, that was hot stuff indeed.

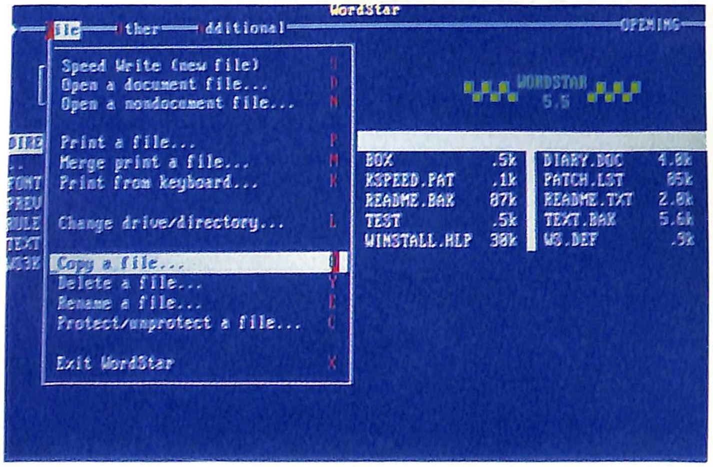
Of course, being a line editor, ED wouldn't let me see more than one paragraph at a time.

The only reason I'm mentioning all this is to put into perspective how I felt when I got my first (CP/M) version of WordStar. Revolutionary wasn't a strong enough word.

The reason WordStar has all those strange control-key combinations for moving the cursor is that it was originally designed for CP/M machines (like the Apple II+ with softcard) that didn't have function keys or arrow keys, or at least didn't have the same ones as other CP/M machines had. Remember that this was before the IBM PC (more or less) standardised keyboard layouts forever.

Okay, I hear you say, WordStar was great in its day. But now? Well, old habits die hard, and I am actually writing this using WordStar 4.0 on a PC. I'm still using the control-key combinations to move the cursor around, and I still swear by WordStar.

Part of the reason I still use it is that I don't need any fancy formatting from my word processor — Ventura does all that for me. The other reason is that WordStar is the only package of any size that has no known bugs. WordStar never locks up on me. And I like that a lot.



```
BOX             .5k   DIARY.DOC    4.0k
KSPEED.PAT      .1k   PATCH.LST     65k
README.BAK      87k   README.TXT   2.0k
TEST            .5k   TEXT.BAK     5.6k
WINSTALL.HLP    30k   WS.DEF        .9k
```

WordStar was revolutionary in its hey day, but now is left behind by products such as WordPerfect

The XT/AT bus

Earlier in this article I dealt with the Taiwanese clone industry. That gave Apple — a company that started in a garage — much more of a scare than it gave IBM. Apple came down heavily on the clone makers wherever it could: it took an Australian company to court over copyright infringement. IBM seemed to ignore the whole problem, presumably on the basis that its customers (ie, mainframe customers) wouldn't be buying clones anyway.

All of this is background to the story of the bus. In the days before the Apple II, there were a number of microcomputer buses around. The most widely-regarded was the S-100 bus, so called because it had 100 pins.

With the introduction of the Apple II, a computer with a bus, the whole field of add-in hardware opened up. There were even cards (like the 'softcard' mentioned earlier in this article) that would turn your 6802-based Apple into a Z80 CP/M machine. All of this openness explained some of the popularity of the Apple II, especially with educational establishments. It made the machine inherently more flexible, because you could buy any number of add-ons from a large number of sources.

But the clone experience made Apple think again; its next machine, the Mac, was a 'closed architecture'. You couldn't plug cards into it, and no-one (until recently) copied it. IBM could have taken that road early on, when it released its PC, but it didn't.

Instead, it took what in retrospect might be seen as a brave step, and opened its architecture. In doing so, it made the PC, and later the AT, inherently more flexible at the user end. When you buy a PC you are not limited to the on-board memory capacity, you're not limited to the on-board disk drive capacity, or the on-board video hardware.

Of course, IBM has now closed its architecture again. The PS/2 range has a bus that is closely guarded by all sorts of legal and technical devices, to the extent that a card manufacturer needs permission from IBM just to build a card to plug into the PS/2. Apple re-opened its bus eventually with the NuBus, also taken up by NeXT. Will IBM be forced to follow in Apple's footsteps?

END

Phil Cohen is a consultant with Hard Copy, a documentation consultancy that specialises in writing user and technical documentation for hardware and software. He can be contacted on (02) 27 3437.

Worst products

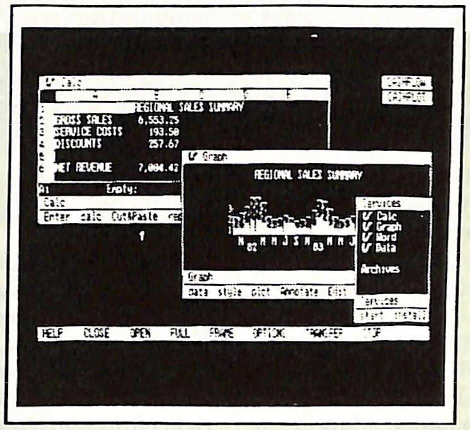
Boy, have we witnessed some shameful products since the inception of the PC industry. Kester Cranswick looks at the under-side of the last 10 years, and digs up the worst products he can find.

This category casts a jaded eye back on some of the most useless outpourings of the PC industry. Some products are rotten because they were never a good idea in the first place; others were too little, too late; and a few show why quality control is important in any type of product.

Some products have escaped this list because their developers remedied their shortcomings as soon as they could. For instance, MS-DOS 4.0, Microsoft Word 3.0 and the original NetComm Faxcard were all duds for a while, but went on to become good products.

We have also not included products that have never quite lived up to the hype that preceeded them. Products such as Agenda, dBASE IV and OS/2 will get there eventually.

No, this list only includes products that never had a chance. The terrible 10 is a reminder that to make a mistake is human, and to really foul up you need a computer.



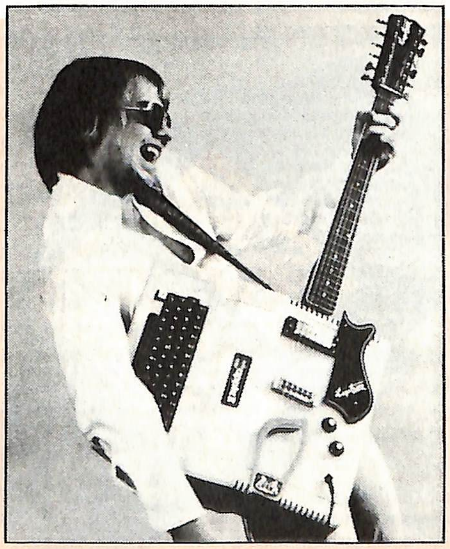
```
REGIONAL SALES SUMMARY
GROSS SALES      6,553.25
SERVICE COSTS      193.50
DISCOUNTS          257.67

NET REVENUE      7,004.42
```

A typical VisiOn screen with word processor, plotting and spreadsheet windows

Apple IIGS Guitar Synthesiser

Culled from the 1981 archives, this scoop photo shows an Apple employee demonstrating a prototype of the 12-string Apple IIGS, or Guitar Synthesiser. The product never made it to the shops in its prototype form for a number of technical reasons. Firstly, the display mechanism, involving a video lead from the guitar to a unit that projected images onto the inside of the user's dark glasses, tended to cause sensory overload, as shown in the photograph. Secondly, the user had to be trained to keep their elbow away from the RESET button.

The original IIGS was designed to teach anybody to play fuzzbox guitar. It had software that would sound a chord and ask the user to either identify or play it. Fortunately for Apple and would-be guitar heroes, somebody suggested that a MIDI interface might be a better approach to the problem of combining micros and music.



Nope, this isn't a setup. Bill Fickar, lead 'guitarist' of The Broken Rubber Band demonstrates the Guitar Synthesiser

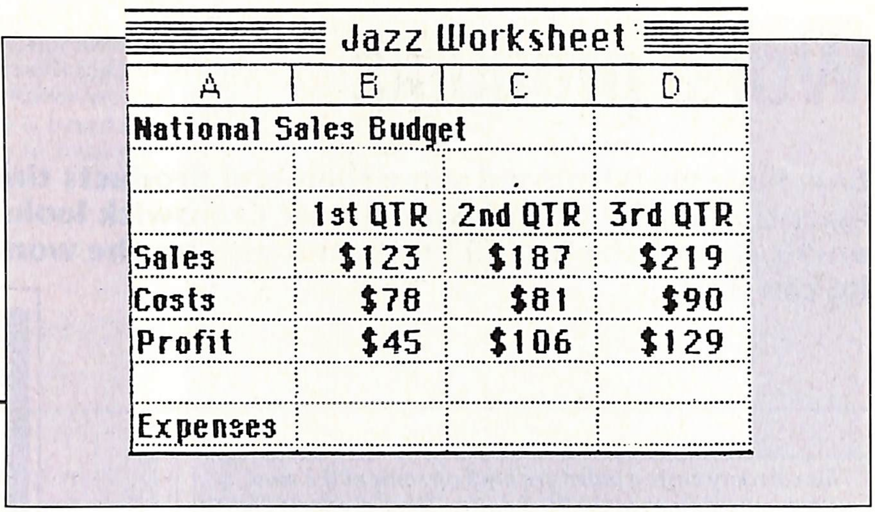
PCjr

IBM has never really succeeded in cornering the home market. It is not for lack of trying, but after the lamentable failure of its PCjr, it just about gave up. The PCjr, or Peanut as it was christened, never saw the light of day in Australia. Launched in the US in 1983, it became Big Blue's only major product embarrassment.

In essence, it was a stripped down version of the PC, aimed at the home user. Some specifications were common to both computers, such as the 360K 5.25in disk drive, but there were some decidedly non-standard innovations that managed to sink the Peanut. The most radical was a cartridge data storage device. The Peanut had two cartridge slots and IBM hoped that software developers would start distributing their software in the new format. Lotus's release of a cartridge version of 1-2-3 was one of very few supportive gestures.

Sound and graphics were a strong point of the Peanut. Unfortunately, they were non-standard and few software developers were prepared to develop products to take advantage of the new features.

Even the slickest Charlie Chaplain advertising could not rescue the Peanut from its ignominious fate. It sunk with barely a trace. IBM Australia was wise enough not to import the product. Instead it launched the JX as an educational computer. Though hardly a roaring suc-



Jazz Worksheet

A	B	C	D
National Sales Budget			
	1st QTR	2nd QTR	3rd QTR
Sales	$123	$187	$219
Costs	$78	$81	$90
Profit	$45	$106	$129
Expenses			

Jazz was not such a bad product; it was more a case of being in the wrong place at the wrong time

cess, it at least stuck to standards and managed to sell in reasonable numbers.

VisiOn

Before Windows there was VisiOn, the ambitious attempt by VisiCorp, of VisiCalc fame, to introduce a mouse driven, windowing user interface to the MS-DOS world. It was launched in 1983, just when the world had proclaimed the Apple Lisa a masterstroke. It had windows that could be moved around the screen with a mouse, menus and a heap of promises to support the product from major software and hardware vendors.

VisiOn ran on a 16-bit MS-DOS PC with 256K of RAM, at least 5M of disk and a bit-mapped display. The interface was primarily textual and the first three VisiOn products were VisiOn Calc, VisiOn Word and VisiOn Graph.

Comparisons were made with the Lisa interface from the word go. It was universally agreed that the Lisa made a better job of it. For instance, resizing a Lisa window was a simple matter of dragging the corner of a window. With VisiOn, you had to select a menu option, then select the appropriate window, then select the upper left position of the resized frame, then select the new size of the window!

Scrolling text in a window was not easy either, as the speed of the scroll depended on how long the mouse button was pushed. And the intuitive cut-and-paste operation of the Lisa became a six-stage process under VisiOn.

Another omission was the ability to retrieve a deleted file or to revert to a previously saved version. And the interface was cluttered, difficult to understand and s-l-o-w. Even a 25MHz PC with VGA graphics would not be able to improve on the basic 'yuk' of VisiOn. VisiCorp promised improvements, such as a macro facility and a database package, but they did not eventuate. It was perhaps VisiCorp's last gasp before vanishing into obscurity.

Jazz

Midway through the decade, Lotus decided to try a 1-2-3 on the Macintosh world. In a fit of inspirational frenzy, it dreamed up Jazz and immediately began trumpeting it as the software that would legitimise the Macintosh as a business tool.

Rumours of the product circulated for months. It was going to be an integrated suite of software able to handle all the computing needs of the average executive who had bet their business on a Macintosh. It was to combine word processor, spreadsheet, database and communications modules. Being a Lotus product, the spreadsheet was the dominant component.

Considered in isolation, Jazz was not such a bad product. As is the case with most integrated software, it had to be a jack of all trades, master of none. But it had dynamic links between the various modules, good graphics for the spreadsheet and the benefits of the Macintosh interface. The telecommunications module was useful too, given the dearth of such products when Jazz was launched.

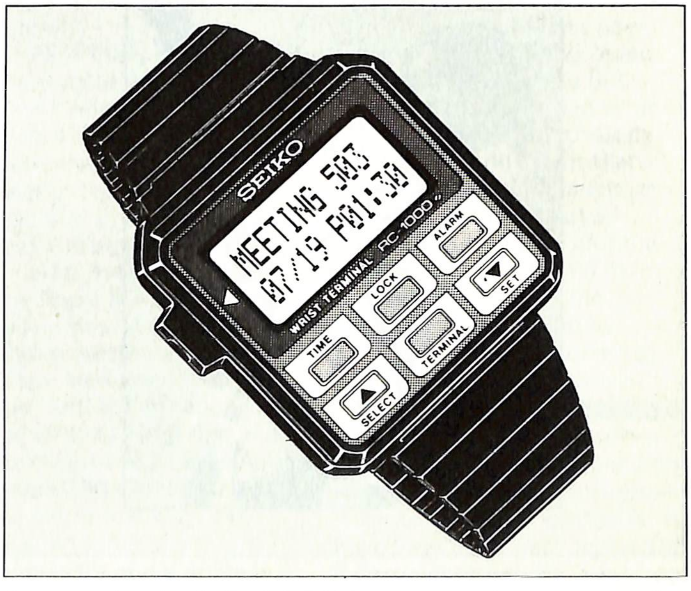
But at the time of the launch, two external factors counted against it. At the time, people buying a Macintosh were given a free copy of MacWrite, a modest word processor that the Jazz equivalent did little to improve on. And Microsoft had just launched Excel, a Macintosh spreadsheet with graphics features that swung many 1-2-3 users over the Macintosh platform.

Jazz had its own limitations too. It needed a 512K Macintosh with two drives, whereas the bulk of users were still on 128K Macs. It was slow to use, particularly if files were called from disk, and the database lacked a substantial query language.

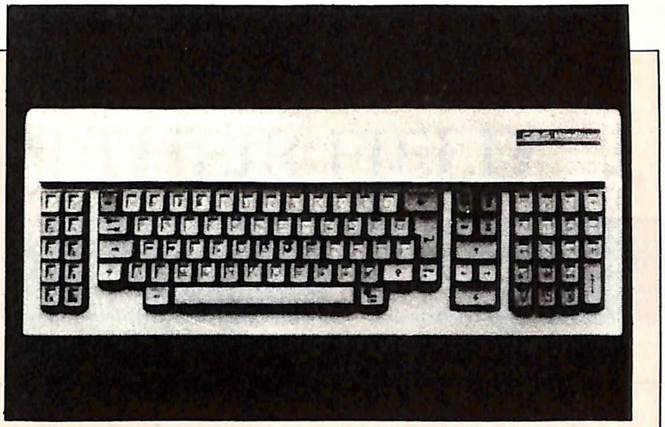
In short, it failed to catch the imagination and became one of Lotus's most noticeable flops. Microsoft Works is the integrated package of choice for the Macintosh these days. Jazz was just a little out of tune with the times.

Seiko RC-1000

The Seiko RC-1000, launched in mid-1985, was straight out of the pages of an Ian Fleming thriller. At



As a novelty the Seiko RC-1000 was great, but try to use it for anything useful . . .



The nightmare that came to life: the Reconfigurable Keyboard

first glance it seemed just another high-tech wristwatch. But the knowledgeable observer would know that this piece of Japanese overkill was in reality a portable data terminal.

It came with software for the Commodore 64, Tandy Model 100, Epson PX-8, IBM PC and Macintosh, plus a cable that allowed data to be downloaded from the computer to the watch. The watch display was two 12-character rows. Normally they would show the time, date and alarm status, but harness the power of the PC and, in theory, the RC-1000 became a diary, alarm, scheduler, even a phone directory. When an alarm sounded, the relevant message was called up.

But the 80 screens of information that could be stored were hardly enough for the busy executive. Software on the PC stored and managed data. Trouble was, it was not very good software. It had too many menus, did not use the full range of available keys and was cumbersome in the extreme. With data downloaded to the watch, you could really impress your friends. Sporting six large buttons, the RC-1000 looked more like a prop from a Dick Tracey novel than a serious time-keeping instrument. The overall feeling at the time was: what use was there for it?

Suffice to say, apart from its novelty value, there was little to recommend the RC-1000. It fitted into the same category as another Japanese monstrosity, a track shoe with a built-in microprocessor that could be connected to a computer to display running statistics!

Nowadays, pocket PCs and devices such as the Sharp IQ-7200 provide on-the-move data for those who won't keep a diary.

Reconfigurable Keyboard

Any discussion of naff keyboards has to lead to an anonymous input device reported on in August, 1986. The ever-watchful Guy Kewney found this answer to every typists nightmare.

It looked like a standard XT keyboard, but the clever inventors had decided that there might be users out there who wanted to be able to reconfigure not one, but every key on the keyboard.

The result was a keyboard with every key having an LCD display. Every key could be reprogrammed to output any character, any character could be displayed on any key.

Fortunately, this device was confined to Asia and, to our knowledge, did not reach Antipodean shores. We could just imagine the keyboard suddenly re-defining itself to be ABCDEF rather than QWERTY, or to have a Dvorak-style layout, or even to have no vowels. Wht fn tht wld b!

Softstrip

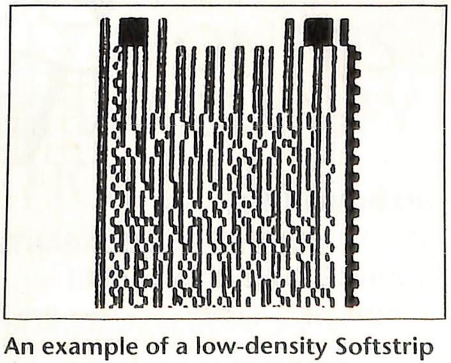
Back in the early days of home computers, every magazine would publish long program listings for users to laboriously type into their computers. Surely there had to be an easier way. There were some ridiculous solutions, such as a British television station that used a flashing signal in the corner of its computer show programmes to beam software to users who had built a device that could read the signal. But the problem was largely unsolved until . . . 1987.

The company that thought it had the answer was Cauzin, which developed a technology called the Softstrip. It involved a strip of printed paper — on which was printed the encoded data, and a strip reader able to translate that code into an executable program — all for the rather extravagant amount of $759.

The kit came with a utility that let a printer churn out Softstrips of your programs. Each strip could contain from 900 to 5500 bytes of information, though a program could be scattered across many strips. But speed was a major problem. Turning a 21K file into 26 Softstrips took nearly an hour. Reading it back in took 20 minutes.

The developers suggested that Softstrip would be an ideal means to disseminate spreadsheet templates, clip art, price list updates and so on. They even suggested that Softstrips could be printed in magazines so that anyone with a Softstrip reader would not have to type in the data.

But the price saw to it that few organisations bought the Cauzin technology, and nobody bothered to make Softstrip versions of their software. As the reviewer at the time said, it was a product "all dressed up, with nowhere to go." And that is precisely where it did go — nowhere.

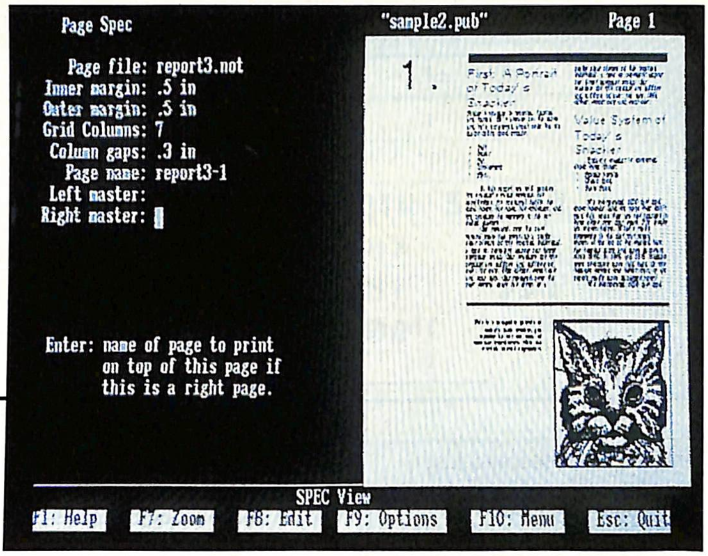


An example of a low-density Softstrip data strip blown up to twice its normal size

Byline

1988 was not a good year for Ashton-Tate. Come to think of it, neither was 1989, and 1990 is not looking too hot.

But 1988 was the year when two clangers hit the streets. dBASE Mac showed that not all transplants from



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Ashton-Tate seems to have missed when it originally tried to board the DTP bandwagon

the MS-DOS world worked wonders for a Macintosh. But the sleeper that refused to wake up was a little known desktop publishing package called Byline. Not heard of it? Well, it ran under MS-DOS and was described by the *APC* reviewer as "a hurriedly prepared product, alarmingly simple in design and seriously lacking in sophistication."

It was based on the premise that DTP could be done without a mouse. Users had to move items around a page with cursor keys, or type in their co-ordinates.

There were many shortcoming to Byline. For instance, the WYSIWYG document display gave only an approximation of what you would get. Near enough is not good enough. The program did let users import dBASE databases, but would not read Microsoft Word documents. It had five typefaces, though only two were any use; allowed only very limited typographical manipulation; and did not even allow users to change the inter-column spacing.

The graphics facility extended only to lines and boxes. The product did not support tints or reverse-outs. It did have a modest word processor, but any power word processor was able to do more than Byline.

Yep, we hated the product. Slow, cumbersome and manifestly unsuited to the task it was designed for, Byline has now become a byword for inept software.

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& EEMS

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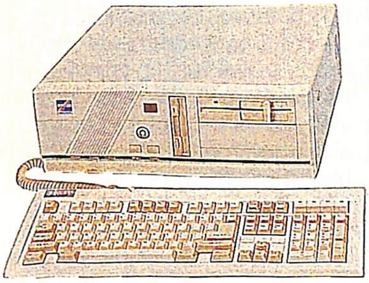
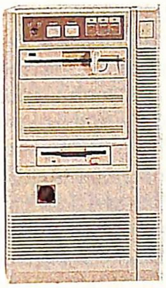
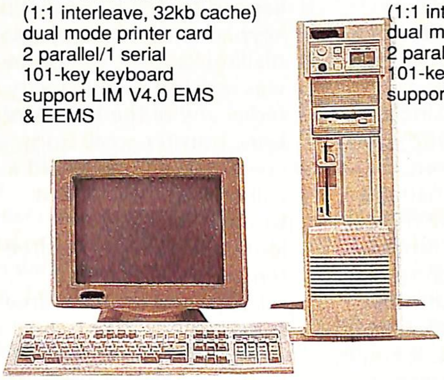
(1:1 interleave, 32kb cache)
dual mode printer card
2 parallel/1 serial
101-key keyboard
support LIM V4.0 EMS & EEMS







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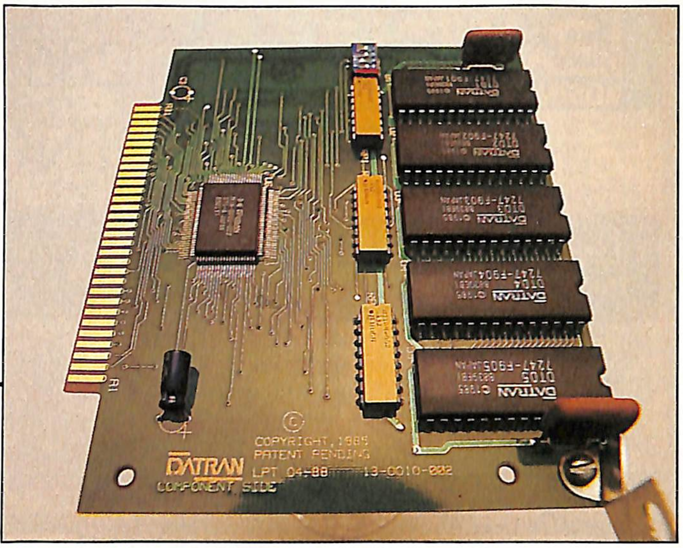

Datran's Diskdoubler was destined for the scrapheap

ComputerPhone

In 1985, the definition of a disaster was a product built around components designed by Clive Sinclair, developed by ICL and marketed by Telecom. Things may have changed now, but what gave rise to that gag was the ComputerPhone. The idea was great. Combine a personal computer with a telephone in one integrated unit. It could run a ROM-based suite of software, had a built-in modem and speech synthesiser, could handle two phone lines and did not take up too much space on the desk.

The Sinclair evidence was most visibly a pair of microdrives used for data storage. The microdrive used tape to store around 100K of data. It was slow, unreliable and never a serious data storage option. The Motorola 68008 and two other custom chips were inherited from the Sinclair QL, Clive's least successful computer, and the Basic is adapted from Sinclair's SuperBasic.

ICL's proprietary operating system shared much with the QL's QDOS, so much so that the ComputerPhone was supplied with Psion's Xchange suite of software, designed for the QL.

The keyboard was a budget affair, with a non-standard layout involving three function numeric keys, a rubberised key switch mechanism, a tiny Enter key and a combined insert/delete key. The numeric keypad tripled as a function keypad and the telephone dialling keypad. Telephony was assisted by the ability to redial any of the last six numbers, transfer a call from voice to data lines, hold a call or even time it. But though there is a loudspeaker for handsfree listening, there is no microphone for handsfree speaking!

As a telephone, the ComputerPhone was quite smart. As a computer, the software was limited in quantity and quality. As a result, Telecom still has a warehouse full of this futuristic product it is happy to sell to anyone.

Diskdoubler

A product does not need to be from a major league player to be a dud. Take the case of the Datran dd200 Diskdoubler, launched in early 1989. There were three local importers advocating its seemingly miraculous features.

The Diskdoubler was an internal card designed to double the storage capacity of a hard disk. A 64K TSR utility intercepted DOS calls to the drive and directed data through the Diskdoubler board where proprietary algorithms compressed it. It was claimed the Diskdoubler would squeeze a 100M dBASE into 20M of space. It would lift the 32M DOS barrier to 64M, and increase system performance because files were smaller. It sounded just a little too good to be true.

Datran claimed an average compression of two to one, with dBASE files compressed by up to eight to one. When put to the test, it was found compression was only around 10 to 15 per cent, a far cry from the manufacturer's claims.

The product was meant to be compatible with most popular programs. In the US, maybe, but here there were plenty it would not work with. Worse, with incompatible software, data was corrupted. The card worked well with ASCII files, but few users would take the time to convert their documents to text to have them saved.

The Diskdoubler was also pretty useless when compressing small files, for it ran into DOS's minimum file size allocation limit. For larger files, it might work. But users with plenty of larger files would probably have larger disks and be less in need of something such as the diabolical Diskdoubler.

It all added up to a product destined for the scrapheap. The world thought so too and Datran is now out of business. As for anyone who bought the device, the lesson is never to believe in miracles.

END

"Whoa, hold the phone! It says, 'The electricity coming out of a surge protector is generally cleaner and safer than that going into one, unless-un-lesss-you are standing in a bucket of water'."

Most notable companies

Jeremy Horey takes a look at 10 companies that have shaped the PC industry and set the standards for other manufacturers to follow. As *APC* was going to press, two companies in this article, Lotus and Novell, announced their 'mega-merger'. See Newsprint for further details.

In just a couple of months we will see the ninth anniversary of the most significant event in the whole microcomputer industry: on August 12, 1981, IBM introduced its PC. Microcomputers had been around for about five years and Apple already had its Apple II on the market, but the IBM PC opened up a period of unbelievable growth. In 1981, Bill Gates was still (relatively speaking) a poor man, and nobody had ever heard the name Compaq. Yet less than 10 years later, Bill Gates has become the youngest man to make a billion dollars and Compaq has set a world record as the fastest growing company.

Other companies have grown from one-man operations to huge multi-nationals making hundreds of millions of dollars profit every year. The PC industry is the only endeavour in the world where 10 per cent annual growth is considered a poor result. Until last year, most PC companies considered 30 per cent annual growth as normal.

The IBM PC set a standard that other computer manufacturers could follow; it provided a platform that software developers could write to so everybody made money. A few companies have come to dominate the industry, and this article is the story of the 10 leaders. These giant corporations have offices in every part of the globe — they all have branches here in Australia and are all based in the US. This should come as no surprise, once you understand that the US market is as large as the whole of the rest of the world's put together.

These notable 10 companies have done more than just make money. Their products have made standards that others have followed. They have helped to determine the way the industry has developed.

Just IBM

Business:	Just about everything in computing
Founded:	1914
Number of employees:	387,000
Annual sales ($USM):	$63,000
Headed by:	John Akers, Chairman and Chief Executive Officer

IBM

'No matter how large and standardised the marketplace is, IBM can redefine it', according to Estridge's law. (Philip Estridge was vice president of the IBM division that developed the PC.)

IBM is the largest computer company in the world. In revenue terms it is more than four times larger than DEC, its closest rival in the computer industry. Since the company introduced the PC in 1981, it has played a pivotal role in the PC industry — IBM defined the standard PC platform covering both 8-bit and 16-bit bus machines. Compatibility is *defined* as how close a machine comes to the IBM standard.

Yet when IBM developed the PC it had no idea that the machine would have such an impact. IBM had failed to see the importance of the minicomputer, and left the market open for DEC to develop. This cost the giant company dearly and IBM executives were determined not to let this happen again with the microcomputer. The company set out to develop a machine that would compete with the Apple II and the group of CP/M microcomputers that dominated the fledgling market. At that stage, there were only 10,000 to 20,000 microcomputers sold each year; a growing number of which was going to business customers rather than the home market.

Rather than developing a bold new strategy, IBM put together the PC using off-the-shelf components selected on price rather than on the merit of technological innovation. IBM chose the Intel 8088 microprocessor to power the PC because it was cheaper to build a machine that did not have to deal with 16-bit connections between the chip and the rest of the machine. At the same time, the 8088 allowed IBM to sell the new computer as a 16-bit machine because the chip has a 16-bit internal architecture.

Whatever the basis for the design decisions that went into the PC, the inclusion of the expansion bus was a master stroke. The expansion bus, combined with a healthy third-party expansion board industry, allowed PC users to cheaply customise their machines for a variety of applications.

The new PC was an instant success, and because no-one had expected it to do so well, demand far outstripped supply. Within a few months IBM was shipping 30,000 machines a month — more than the annual output of the whole industry prior to the PC.

IBM followed up the PC with the PC-2 in 1983. This machine expanded the memory available on the motherboard from the laughable (in today's terms) 64K to 256K. The XT which followed added support for hard disk drives and again expanded the maximum amount of memory on the motherboard — this time to 640K.

In 1984, IBM introduced the PC AT, the so called Advanced Technology machine. The bus on this microcomputer could support 16-bit transfers between the expansion boards and the microprocessor.

All these machines set standards that other manufacturers followed. At the same time as IBM was upgrading its computers, it also upgraded its display systems. There is only one display standard that is not based on IBM systems — the Hercules Graphics Card. Even

Apple: the competition

Business:	PC manufacturer
Founded:	1977
Number of employees:	10,800
Annual sales ($USM):	$4071
Headed by:	John Sculley, President and Chief Executive Officer

in keyboard style, IBM has set standards.

It is only since 1987, when IBM introduced the PS/2 range, that the company has lost some of that power to set standards. The Micro Channel architecture (MCA) — a 32-bit bus — has not spawned the host of imitators that the PC and AT buses did in the first half of the 1980s. Indeed, a rival group of PC manufacturers has developed its own 32-bit standard — the EISA bus.

This is not to say that the PS/2 has not been successful. IBM has sold more than three million units. However, the halcyon days of the early '80s when IBM had a massive 40 per cent of the PC market are over.

Bad decisions have cost IBM this market lead. The company did not see that performance would be such a major issue in PCs. It did not ensure that its machines were as fast or faster than other companies' offerings, and was too slow in releasing PCs based on the 80386 microprocessor. It relied too much on its reputation for quality and service and did not pay enough attention to price/performance ratios.

The future

IBM is still far from a spent force in the PC industry. MCA may yet become the standard for the 32-bit buses that will dominate the PC industry by the mid 1990s. The company still sells a lot of machines, has a massive R&D effort and still has many loyal customers.

IBM is being consistently out-manoeuvred in a much more sophisticated market. No longer do the initials IBM ensure that a new product will set a new standard.

Although Apple was a part of the original pre-IBM PC microcomputer industry, it has done more than just survive; it has prospered.

Apple experienced a very tough time in the early 1980s as the IBM PC supplanted the Apple II as a main choice for business microcomputing. The Lisa, Apple's first challenge to the new PC, was a dismal failure, but the company learned from its mistakes. The Macintosh, released in 1984, was a huge success.

The Mac was designed from the ground up as a graphics computer, which meant that it was much better at handling graphics applications than PCs. From the start, it was based on a 32-bit microprocessor, the Motorola 68000. The extra grunt of this processor and the Mac graphics orientation allowed Apple to build a graphical user interface at a time when PC users were stuck with the cryptic C> prompt interface. So from the start, the Mac had two advantages over the PC: it was easier to use, and it had better graphics capabilities.

Apple also built much better sound processing into the Mac which, along with its graphics, gave it an edge for games. In spite of Apple's premium prices, the Mac found loyal customers among users of graphics applications and in the home market.

But the early Macs had some serious deficiencies: they did not support colour, and they had no expansion bus. In 1987, Apple solved both these problems with the Mac II. This machine had both colour and an expansion bus. Since then, Apple has fleshed out the Mac line with a series of very well designed machines. The Mac IIcx was a masterpiece of modular design — the guts of the computer are held together with just one screw. With the release of the super-fast Mac IIfx, Apple now has a machine that can match PCs at every level of performance.

Apple has created a genuine alternative to the IBM-compatible path. The company holds between 15 and 20 per cent of the microcomputer market and most major software developers have versions of their programs that run on both the PC and the Mac.

Apple does have its critics, though. The most frequently heard complaint is that Apple will not allow anybody else to manufacture Mac compatibles. The profit margin for Apple on each Mac it sells is around 50 per cent. Apple officials claim that the company needs this sort of profit to continue its development.

The future

Apple seems to be in a much stronger position now that its top-of-the-line Mac IIfx can match the performance of the fastest 486-based PCs. However, the company's strategy of concentrating on providing just workstations rather than a complete integrated range that includes high-performance servers may be a weakness in the future. In the business world, Apple is competing with companies like Compaq, which offers both workstations and servers, thereby providing a complete solution for business computing needs.

At the same time, the company's lead in graphical user interfaces is being challenged by products such as OS/2 Presentation Manager and Microsoft Windows.

Since Apple can't compete with PC manufacturers on price, the company must maintain a technological edge. The worst danger for Apple is the belief that its lead is unassailable and there is evidence that the company is somewhat complacent. For instance, before the release of the IIfx Apple's machine trailed behind the PC world for about 12 months in terms of performance.

The next two years will be crucial for Apple's place in the industry. If the company can introduce more innovative versions of its operating system and keep improving its hardware, it will be able to maintain its place as a significant player in the microcomputer industry.

Intel: the foundation

Business:	Manufactures microprocessors and PCs
Founded:	1968
Number of employees:	20,800
Annual sales ($USM):	$2875
Headed by:	Andrew Grove, President and Chief Executive Officer

intel

Except for a few short years at the end of the 70s and beginning of the 80s, Intel has played a leading role in the design and production of microprocessors. Ironically, it was during this time when Zilog had carved out a large market share with its Z80 processor that IBM chose Intel's 8088 processor to power its new PC.

Intel introduced the first microprocessor in 1969 to a somewhat indifferent world. This was the 4004, a 4-bit chip originally designed to power calculators. Intel followed this with the 8008, an 8-bit chip used as the basis for early microcomputers. By 1978, Intel had the first true 16-bit chip, the 8086, ready, but in the meantime Zilog, staffed by ex-Intel engineers, had released the Z80. The Z80 used a superset of the 8008's instructions and ran much faster. It quickly captured the imagination of early microcomputer designers and Intel was left out in the cold.

IBM chose a downgraded version of the 8086 — the 8088 — as the processor for its PC. Computers based on the 8088 and 8086 soon dominated the microcomputer market. Intel kept improving its designs and in 1982 added the 80286, and in 1985 the 80386. By maintaining upward compatibility between each processor in the 80x86 family, Intel was able to ensure a ready market for each processor as it shipped. Each chip provided more power and so could run existing applications faster.

Intel has not had things all its own way. NEC has developed two chips that are compatible with the 8088 and 8086. These are the V20 and the V30, respectively. Both chips are faster than the original Intel chips, and the NEC chips have taken a small but significant share of the market.

Intel has licensed other manufacturers to produce the 80286 microprocessor, although it has not so far allowed anyone else to produce and sell 80386 chips. This has caused some concern among PC manufacturers; they claim Intel is keeping the price of the 386 high to maximise its profits, and they are also concerned about a growing shortage of the chips. Intel has responded by pointing out that it has consistently reduced the price of its microprocessors as it recoups the cost of the initial development.

As each new microprocessor in the 80x86 family has come onto the market, it has gradually supplanted earlier chips. We are just entering a period when PCs based on the 386 will be more popular than machines based on the 286. Intel already has a new microprocessor in the 80x86 family on the market: the 25MHz 486, a chip that is roughly twice as powerful as a 33MHz 386. The 486 is just starting to ship in volume.

Intel has not just been making chips. For several years the company has been building PCs. It really only manufactures the motherboards and then sells these to OEMs, who add the other components and sell the finished items. This is also causing concern to PC manufacturers who believe that Intel has an unfair advantage in this area.

Intel also manufactures add-in boards for PCs. It has a range of memory boards, the Communications Co-Processor and Visual Edge. Both the Communications Co-Processor and the Visual Edge are innovative products that show the quality of the company's R&D effort.

The future

Although Intel is not growing as fast as some of our other 'Notable 10', the company has a better than 20 per cent annual average growth and has a secure place as the main supplier of microprocessors to the PC industry. However, it will have to do something to allay the growing disquiet among PC manufacturers about its failure to license any other chip manufacturer to sell the 386. And Compaq has just invested in a small company that has developed a 386 clone chip set.

Intel is adding other strings to its bow. It has invested in Digital Video Interactive (DVI), a new technology that promises to provide CD-ROMs with full motion interactive video in the next couple of years. Compaq's computers have an enviable reputation as the

COMPAQ

Rolls-Royce of PCs. The company has convinced consumers that Compaq computers are the best machines on the market in terms of quality, compatibility and performance.

This has enabled Compaq to charge premium prices for its PCs, making it the fastest growing company ever. By 1987, Compaq had grown from nothing to a one billion dollar company. It continues to average around a 75 per cent annual increase in sales.

Although Compaq started out producing portable computers, it quickly saw what IBM had missed: that performance was becoming a critical issue for PC consumers. Compaq leaped through the window left open by IBM and in 1986 introduced the first PC based on the Intel 80386 microprocessor.

In the next four years the company honed its approach with a commitment to tech-

Compaq: a Rolls-Royce strategy

Business:	PC manufacturer
Founded:	1982
Number of employees:	18,000
Annual sales ($USM):	$2065
Headed by:	Joseph Canion, President and Chief Executive Officer

nical excellence. While not always having the fastest machines on the market, Compaq made sure that they were always near the top in terms of performance. It also built compatible PCs, and soon software developers were testing their software on Compaq machines as a matter of course. Nowadays, some manufacturers are even advertising their machines as Compaq-compatible. This must certainly be gall and wormwood to IBM.

The Deskpro 386/33 is a good example of just what Compaq's engineers have been able to do. It is not the fastest 33MHz 386 available, but it scores very well on *all* areas of typical benchtests even though it has only 64K of memory cache and no disk cache. A great deal of effort has gone into optimising performance in all areas of the machine. For instance, the memory sub-system sits on a special high-speed bus separated from the slower I/O bus.

One indication of the stature of Compaq at the end of the 1980s was its role in the development of the EISA bus. In September 1988, Compaq and six other PC manufacturers announced an alternative to IBM's 32-bit MCA bus. Compaq was widely seen as a ring leader in this 'gang of seven' and the company has never wavered from its commitment to this standard. Unlike other 32-bit bus alternatives to MCA, the EISA bus has actually got off the starting blocks and this year saw a number of EISA machines begin to ship.

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The future

Compaq has recently released some powerful machines — the Deskpro 486/25 and the SystemPro. The SystemPro is perhaps the more interesting of the two. This machine was initially offered with dual 33MHz 386s, but it can support two 486s and is powerful enough to challenge most minicomputers. It incorporates features such as duplex disk drives more usually found only on larger computers.

It represents a move by Compaq from desktop machines to providing very powerful servers that can be used as the lynch pin for complete corporate computing strategies. It offers computing at a price that will be very hard for mini manufacturers to meet.

Compaq has backed up the SystemPro with alliances with Novell and Unix developer SCO to provide versions of their operating systems that make use of its dual processor architecture.

With this sort of development under its belt, Compaq looks set to move into the 1990s as a mainstream computer vendor.

Microsoft

Microsoft: a finger in every software pie

Business:	Application and system software development
Founded:	1976
Number of employees:	4000
Annual sales ($USM):	$952
Headed by:	William Gates, Chairman and Chief Executive Officer

Everywhere you look in the PC industry you will find Microsoft products or products that Microsoft has had a part in developing. The company virtually has a stranglehold on PC operating systems. Everyone knows about MS-DOS and its very close relative PC-DOS, and this operating system is still the dominant way of controlling a PC's hardware resources.

Microsoft also plays a leading role in the development of OS/2 and Presentation Manager. The company produces the most popular graphical environment for DOS, Microsoft Windows. What is perhaps less well-known is that Microsoft also continues to work with SCO on its Unix operating system and so has a stake in the third most popular PC operating system.

Microsoft also produces a range of applications software — Microsoft Word, Excel, PowerPoint, Microsoft Works and Microsoft Project. It has a wide range of programming languages — Microsoft C, QuickBasic, Microsoft Basic, Fortran and even Cobol.

On the Mac platform, Microsoft has several leading applications packages — Microsoft Works, Word, Excel and Microsoft File.

Microsoft does not yet have a PC database program, although even in this area it does have a finger in the pie. The company has control of the PC implementation of Sybase's SQL Server technology.

The company has certainly come a long way from the late 1970s when it was only producing programming languages for microcomputers. Microsoft's first major departure from languages was the development of MS-DOS for the new IBM PC. Since then, Microsoft has diversified in every direction and has grown into the largest microcomputer software vendor.

The future

Microsoft must have some good managers for, in spite of the diversity of its range, it is still able to develop innovative products. Word for Windows and Microsoft Windows 3.0 are just two examples of recent products that have been acclaimed by the computer press.

Microsoft plans to have all its products available across all the major microcomputer operating systems (DOS, Macintosh OS, OS/2 and Unix/Xenix). The company is working on a database product for the PC market, but it believes that database server technology will provide a centrepiece for the development of corporate information systems. The database product will certainly have a role as a front end for the SQL Server. When it becomes available, Microsoft will be able to offer a complete suite of programs so that companies will be able to base their whole computing strategy on Microsoft software.

Lotus

Lotus's success in the PC market has been founded on just one product — 1-2-3. This program, in its various incarnations, still accounts for the majority of sales of all spreadsheets, earning the title as the highest selling piece of application software of all time.

It's conventional wisdom that it was Lotus 1-2-3 which ensured the quick acceptance of the IBM PC in business circles. Version 1.0 was a much more powerful package than either of its competitors, VisiCalc or Multiplan. In 1983, 1-2-3 started out-selling VisiCalc. The macro language in Release 2.0 sealed the fate for these two and VisiCalc disappeared. Although Multiplan still survives it has no market share.

It was not until Microsoft bought out Excel that 1-2-3 had any serious competition. Lotus's long delays in bringing out version 3.0 gave other spreadsheet packages an opportunity to win customers. Now that version 2.2 and 3.0 are available, 1-2-3 is again selling well. It doesn't seem that Lotus's decision to split the package into two different forms has dampened demand in the way some pundits predicted.

Lotus has not been content to just concentrate on spreadsheets, and has released a number of other innovative packages. The

Lotus: spreadsheet supremo

Business:	Application software development
Founded:	1981
Number of employees:	3000
Annual sales ($USM):	$556
Headed by:	Jim Manzi, Chairman, President and Chief Executive Officer

most successful of these has been its graphics package Freelance. If anything, Lotus's other offerings — Manuscript, Agenda, Magellan and Notes — have been too advanced. Agenda certainly has not had the impact it deserves because the package is so complex to grasp. Whatever the reason, Lotus's other products have not contributed much to its bottom line.

The future

Lotus 1-2-3 developers are busy porting the package to a number of other environments, including the IBM mainframe world and the Macintosh. The company doesn't have a Windows version and this may affect its profit in the short term.

The quality of the ideas behind products like Agenda, Notes and Magellan indicates that Lotus has a distinct vision of the future of microcomputing. Lotus is also positioning its products to deal with the move to database server technology as the centrepiece of corporate computing strategy in the 1990s. It has its Datalens technology to link it to a whole range of databases, and the company has committed itself to making 1-2-3 a front end to the SQL Server.

Lotus and Novell have just announced that they intend to merge. This will create a very large software company; one that will rival Microsoft.

All these things taken together indicate that Lotus will remain a major player in the PC industry in the 1990s.

Novell: performance first

Business:	Local area networking software
Founded:	1983
Number of employees:	2300
Sales($M):	$440 (89)
Headed by:	Raymond Noorda, President and Chief Executive Officer

NOVELL

Novell is the leading vendor of network operating systems with either 40 or 60 per cent of the market (depending on whose figures you believe). The Novell operating system is installed on about 400,000 networks with around four million users.

Novell's network operating system, NetWare, is a standard, at least as far as that is possible without Novell licensing the product to any other vendors. If any software developer wants to say that his product is 'network ready' or 'network compatible' or any such phrase indicating that it will run on a network, then he/she must ensure that it runs with NetWare.

But the networking business did not just fall into Novell's lap: the company has faced some stiff competition from some of the best and biggest companies in the PC industry. Both Microsoft and IBM have a significant stake in local area networking (LAN) technology.

In 1982, Ray Noorda, Craig Burton and a group of programmers working for an obscure company, Superset, saw a future in networking. They believed that LAN technology would take off, but that it required a high-performance network operating system to really make it work. The rest, as they say, is history and Ray Noorda now is president and chief executive officer of Novell and is reputed to be worth more than $100 million dollars.

How has Novell been able to beat such powerful and well connected opposition? The answer is simply the hard way, through sheer technical excellence. NetWare was built from the disk up as a network operating system. Most other network operating systems were add-ons to conventional operating systems. NetWare is so different that it has its own disk format that is incompatible with DOS's format.

This approach has made it tough for Novell in some ways, but has also paid dividends. It has required a lot more development effort and has given Novell some headaches in maintaining compatibility. The pay-back has been in performance — NetWare is considered to be the fastest network operating system, and in features, Novell was the first company to provide true file sharing on PC networks.

Novell has also ensured that NetWare runs with just about any network adaptor and on just about any network. The network operating system runs with over 100 different network adaptors and on more than 30 different types of network.

The company is also committed to getting NetWare running on a variety of different platforms and to talking to just about every sort of connectivity product available. For instance, NetWare will run on a VAX so that the minicomputer can actually act as a server on a Novell network. Most other network operating systems treat the VAX as just a terminal on the network. Novell has purchased Excelan and, through this company's expertise in TCP-IP, plans to support the communications with every other device that supports this standard.

The future

Where will Novell go from here? How much longer will its six year market domination continue? Some analysts believe that NetWare will face a serious challenge from LAN Manager version 2.0, but they said that about LAN Manager version 1.0 and it has had no impact on NetWare sales.

Novell has a whole series of important alliances in place: agreement with Sun to incorporate elements of Sun's NFS in NetWare; agreements to develop Unix versions of Netware with NCR and SCO; and even agreements with companies like NeXT and IBM.

The company has just released its seventh version of NetWare — NetWare 386 — and it is working on a multi-processor version. There remain question marks over Novell's wide area networking strategy (WAN) and the way the company plans to integrate NetWare with OS/2.

Novell looks like being a major player in networking in the 1990s.

Ashton-Tate: difficult times

Business:	Application software development
Founded:	1979
Number of employees:	1200
Annual sales ($USM):	$265
Headed by:	Edward Esber, Chairman, President and Chief Executive Officer

ASHTON·TATE

In the 1980s, Ashton-Tate's dBASE database management system set a standard for other database developers to follow. The standard was so strong that not only did other developers create applications that could use the dBASE file format, but they also copied the dBASE programming language. Today, many packages outside the DBMS field can retrieve data from dBASE files.

dBASE is the oldest PC DBMS. dBASE II was originally developed for CP/M machines but was quickly ported across to the PC. In 1984, Ashton-Tate released dBASE III and two years later followed it up with dBASE III Plus. Until 1987, dBASE held around 80 per cent of the PC DBMS market.

From 1987, Ashton-Tate has gradually seen that decline to about 30 per cent. The company has faced competition on its home turf from the dBASE clones — products like DBXL, Clipper and FoxBASE — and from non dBASE compatibles products like Paradox and R:Base.

Ashton-Tate was not content to stay just in the database area. It released the word processor MultiMate, and for a time this was the leading PC word processor, but competition from WordPerfect and Word and the failure of Ashton-Tate to upgrade the product saw MultiMate slip down to third position.

Ashton-Tate also sells Draw Applause, a presentation graphics program. This too was a leader in its field, but in recent years has slipped down to third position.

This gradual slide from market dominance has cost the company dearly and last year Ashton-Tate recorded a loss of about $26 million.

The future

A large part of Ashton-Tate's problems stem from its inability to get product upgrades out in a timely manner. The company has been able to fix this problem for all its products except dBASE. New versions of both MultiMate and Draw Applause have recently been released, and the division developing these products has just been re-organised to streamline the development process.

dBASE development still seems to be in the doldrums. dBASE IV was supposed to have support for SQL built in when it was released in 1988. When the new version came out with SQL, Ashton-Tate promised that dBASE IV Release 1.1 would follow quickly with the SQL code. Version 1.1 is now expected in the second quarter this year.

Ashton-Tate believes that databases will form the core of companies' computing strategies in the 1990s. The application categories with which we are familiar today — spreadsheets, presentation graphics and DBMS — will act as front ends to these corporate databases. The company is busy positioning itself with this in mind and its part in marketing the SQL Server is just one leg of its strategy.

If Ashton-Tate can pull this off and get its dBASE development house in order, it will be in a strong position to play as major a role in the 90s as it played in the 80s.

WordPerfect

WordPerfect is the leading PC word processing package. It consistently outsells Microsoft Word in both the US and Australia and holds around 60 per cent of the word processing market. As far as there can be said to be a standard in word processing, WordPerfect is it — most other packages will import or export WordPerfect files.

WordPerfect was originally developed by university student Bruce Bastian. Bastian and his professor, Alan Ashton, then formed WordPerfect to market the word processor.

During the 1980s, the company gradually won market share for its flagship product by constantly upgrading it and ensuring that it was always well supported. Printer drivers are one example of this. WordPerfect comes with the most extensive collection of printer drivers of any word processor. If you do have a printer that is not supported by the shrink-wrapped version, WordPerfect will ship you a special driver free of charge.

The company has slowly broadened its product range by adding a database package, DataPerfect; a spreadsheet package, PlanPerfect; and recently a graphics package, PlanPerfect. All these programs are closely integrated and WordPerfect even provides a menu sys-

WordPerfect: leading the WP market

Business:	Application software development
Founded:	1980
Number of employees:	1800
Annual sales ($USM):	$282
Headed by:	Bruce Bastion, Chairman and Chief Executive Officer; Alan Ashton, President

tem, WordPerfect Library, to link them together. These other application programs are generally only sold to existing WordPerfect users.

The future

WordPerfect is already available on a wide range of platforms, including the Macintosh, Unix systems and minicomputers, and an OS/2 version is expected shortly. If the company is vulnerable at all it is in the Windows area. If, after the release of version 3.0, Windows increases its momentum, then WordPerfect will really need a version for the graphical environment.

Apart from this small cloud, WordPerfect looks likely to maintain its lead in word processing into the 1990s.

BORLAND

Borland: quality programming

Business:	Application software development
Founded:	1983
Number of employees:	600
Sales($USM):	$113
Headed by:	Phillipe Kahn, Chairman, President and Chief Executive Officer

When I selected the 10 most notable PC companies for this article, I found that I had no difficulty filling the first nine places. These nine companies were pre-eminent in their fields, and their products had set universally accepted standards.

Once I had chosen the nine, I was left with a whole string of companies that had made significant contributions to the industry, but hadn't set standards by themselves. In the end I chose Borland, possibly because as an ex-code cutter myself, I still believe that quality programming is one of the most important ingredients for the success of a piece of software.

Borland has produced some outstanding pieces of software. Its Turbo language products have revolutionised programming on the PC. Indeed, Turbo Pascal has come close to setting a new standard for the language.

Borland began in 1983 with a string of language products — Turbo Pascal, Turbo C, Turbo Basic and Turbo Prolog. The company sold these for roughly a third or a quarter of the cost of language products from other suppliers. These Turbo products included a complete development environment, and integrated editors and debugging tools in a way that had not been done before.

From there, Borland started developing a line of applications packages. The first was the very successful SideKick, and Borland then released the database management system Paradox in 1985. Although Paradox is a long way from unseating DBMS market leader dBASE, the program has a growing band of enthusiastic users.

Two years later, Borland brought out its spreadsheet, Quattro. Last year, the company updated it to Quattro Professional, a package that includes many of the features of Lotus 1-2-3 Release 3.0. To fit all the code into a program that can still run on an 8088-based PC with only 640K of memory, Borland resorted to a clever programming technique called Virtual Real-Time Object Oriented Memory Manager (VROOMM). Quattro Professional was very well received and the product is now Borland's Number One earner.

Two other application packages from Borland have not done so well. Its word processor Sprint, although much hyped before its launch, has proved to be too complex for the average user to come to grips with. The flat file database manager Reflex, while receiving good reviews has not been a world beater.

The future

Borland has committed itself to producing versions of its products for both OS/2 and Windows. It was the first company to bring out an application for Presentation Manger, with SideKick for PM. Paradox runs under both OS/2 and DOS and there is even a specific version for 386 machines.

While it seems unlikely that Borland will be able to overtake such software giants as Microsoft and Lotus, the company will certainly be a major contributor to the PC industry in the 90s.

END

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Most memorable quotes

Ian Robinson concludes our 10th Birthday supplement with 10 classic quotes uttered since *APC*'s inception.

“At last, the elephant has learnt to tap dance.”

This quote, supposedly made about the launch of the original IBM Personal Computer in 1981, was attributed to the late Phil Estridge, 'father of the IBM PC' and head of IBM's Entry Systems Division in the US.

“The 286 is a brain-damaged processor.”

Despite spending many years working with IBM to create the OS/2 operating system for 286-based computers, Microsoft's chairman Bill Gates reportedly made this comment, in light of the improvements inherent in the next-generation 386 CPU and beyond.

“The paperless office is about as likely as a paperless toilet.”

This oft-repeated quote regarding the potential for the office automation industry has been attributed to veteran US industry analyst Amy Wohl.

“Go ahead — make my day.”

Paraphrasing one of Clint Eastwood's few lines from the 'Dirty Harry' movie, Ashton-Tate chairman Edward Esber issued this warning to would-be dBASE clone developers, implying that his company would sue them immediately.

“There are still a few insects there that need squashing.”

Mr Esber again, admitting that the forthcoming implementation of dBASE IV still had a relatively high bug count. Given dBASE's bad record in this respect, it's a wonder that any developer would still wish to make a clone of the product.

“It's like a sophisticated escort service where you get to meet some very high-class partners — but the long-term consequences can be painful.”

Chris Howells, the outspoken managing director of Australian modem manufacturer NetComm, used this analogy to describe the Federal Government's controversial Partnership for Development Program.

“This thing looks sort of like a leprechaun's toilet seat.”

Industry commentator John Dvorak coined this description of the 'new-look' Microsoft Mouse, which was glossy designer-white in colour, as opposed to the older rodent grey model.

“We will be turning over $25 million within five years.”

The managing director of a Melbourne-based PC dealership (known as the king of the discounters) made this bold prediction less than a year before his company became yet another victim of the PC industry shakeout. Can you guess which dealership?

“Would you rather sell coloured sugar-water for the rest of your life?”

This was supposedly the challenge that Apple co-founder Steve Jobs directed to Pepsi boss John Sculley, when inviting him to help run Apple. Of course, when you take into account the subsequent ousting of Mr Jobs, he may well have wished that Mr Sculley had not been so quick to take up the challenge.

“IBM compatibility is just a state of mind.”

A marketing manager from the Australian subsidiary of NEC made this startling revelation at the launch of the NEC APC III system at Pancakes on the Rocks in Sydney. The product bombed — mainly due to incompatibility — and the far more compatible APC IV was launched soon afterwards. As for the marketing manager, he's probably back there — making pancakes.

END

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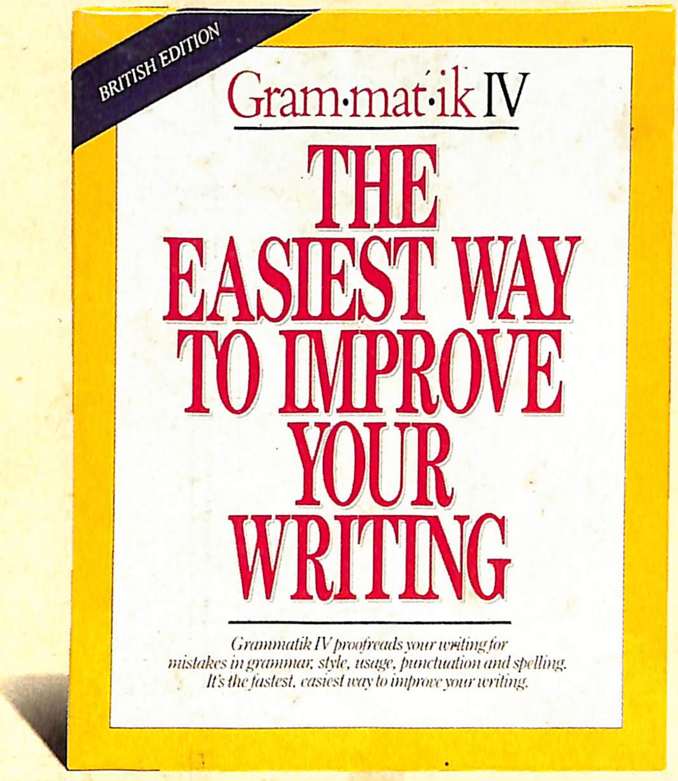
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